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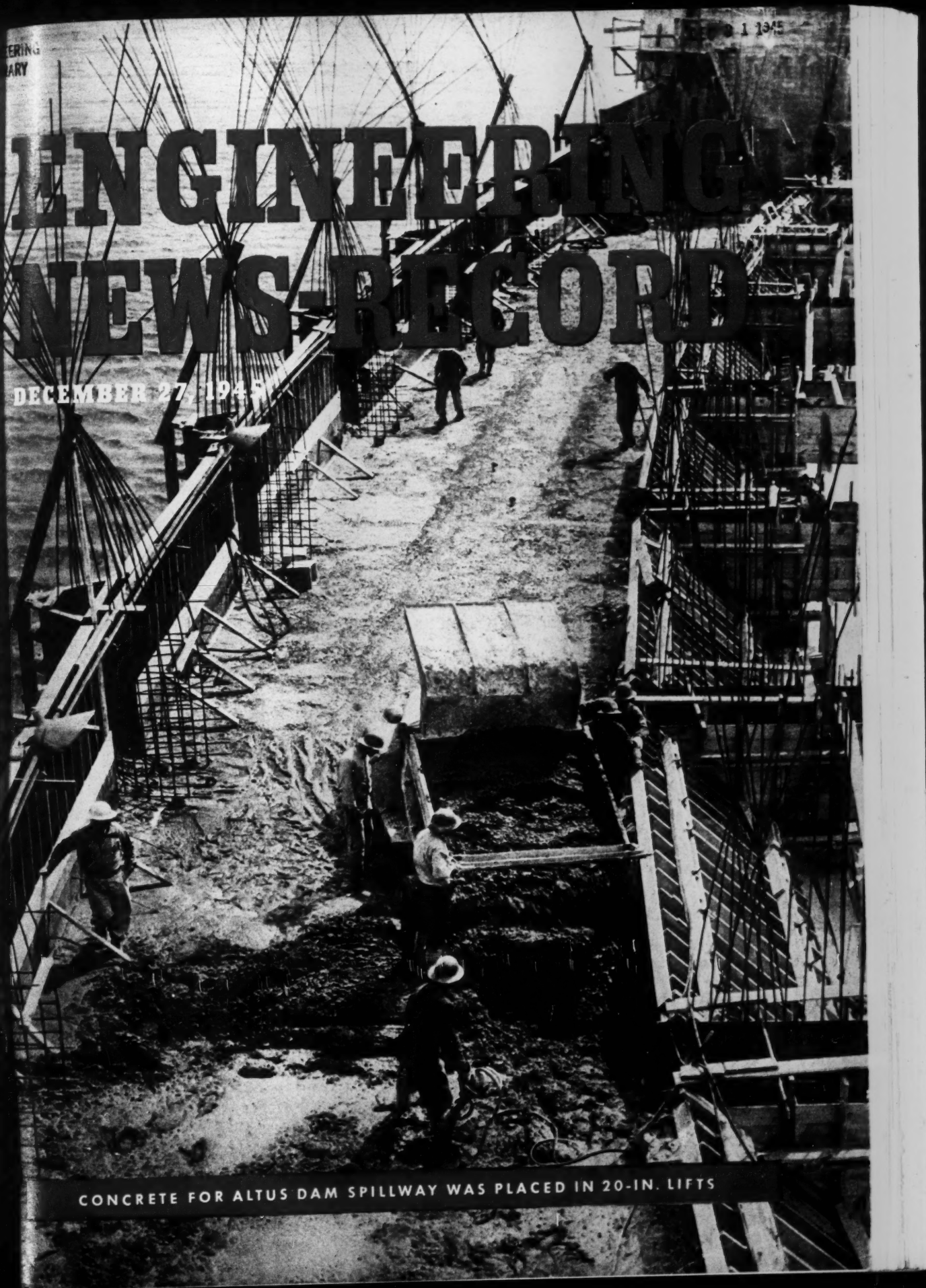
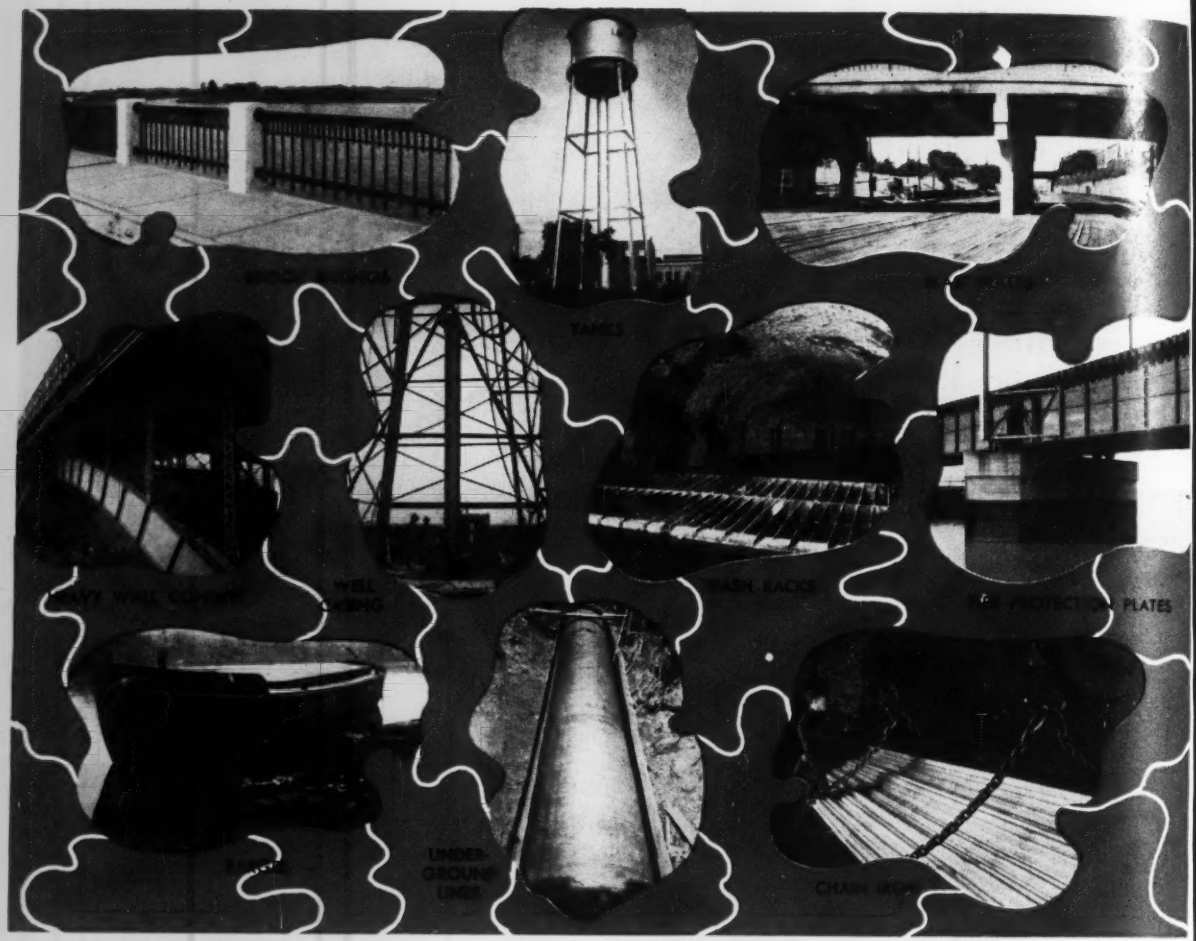
1945

ENGINEERING NEWS-RECORD

DECEMBER 27, 1945



CONCRETE FOR ALTUS DAM SPILLWAY WAS PLACED IN 20-IN. LIFTS



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In any application where corrosion is a major threat to service life, a proven method of combatting the attack is ready and waiting, in Byers Wrought Iron. The illustrations show some of the many places where wrought iron has helped engineers to extend the life and the utility of their structures, and to get the minimum cost-per-year that is the aim of most designers.

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Publication Office: 99-129 North Broadway, Albany 1, N. Y. • Editorial and Executive Offices: 330 West 42nd Street, New York 18

WALDO G. BOWMAN, *Editor* ALBERT E. PAXTON, *Publisher*

Vol. 135 DECEMBER 27, 1945 No. 26

COMING NEXT

• Highway Plans for 1946 is to be the subject of a special section in the January 10 issue. It will contain a report on the amount of new construction planned by the state highway departments, also notes on some of the more important projects.

• Of special interest to contractors is a discussion of cost trends in highway work based on bids received in recent months by highway engineers.

• Standards for the projected National System of Interstate Highways are also included in the highway section of the January 10 issue, and a continuation of a discussion of truck size and weight restrictions.

• For traffic engineers there is an account of the new home-interview method of making traffic surveys; for bridge engineers there is a discussion of bridge rails; and for construction men, there are details of techniques used on U. S. Highway 66 in Illinois. City engineers will find much of value in the article on street inventory records.

• In the Jan. 10 issue Arthur J. Boase will describe the design and construction of a resort hotel in Brazil, which has a roof-top landing field for helicopters, a 152-ft. reinforced concrete ribless dome, and 100-ft. rigid frames and concrete trusses.

LOOKING AHEAD

• The Captain Cook Graving Dock, 1,177 ft. long, now in service at Sydney, Australia, is reported to be that country's greatest engineering achievement. An unusual feature is the provision for dividing the dock into two separate units by use of an auxiliary caisson that can be installed at an interior point. The dock and appurtenant works were built in the dry inside a 33-acre cofferdam. Caisson gates were built inside the cofferdam and floated to position after the cofferdam was flooded. Design and construction will be described in an early issue.

• The Maas River Tunnel at Rotterdam, Holland, now complete, has the distinction of being the largest in cross-section to be constructed by sinking prefabricated concrete sections to the riverbed and connecting the ends under water. Of special interest is the plant and precision methods used in sinking these sections so as to control the line and grade accurately. The project will be described in an early issue.

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Number of copies of this issue printed 41,564

DO YOU WANT AN INDEX?

Due to the paper shortage, no index for volume No. 135 (July-December, 1945) will be issued except to subscribers who ask for it. If you want a copy of the index please send in the coupon below.

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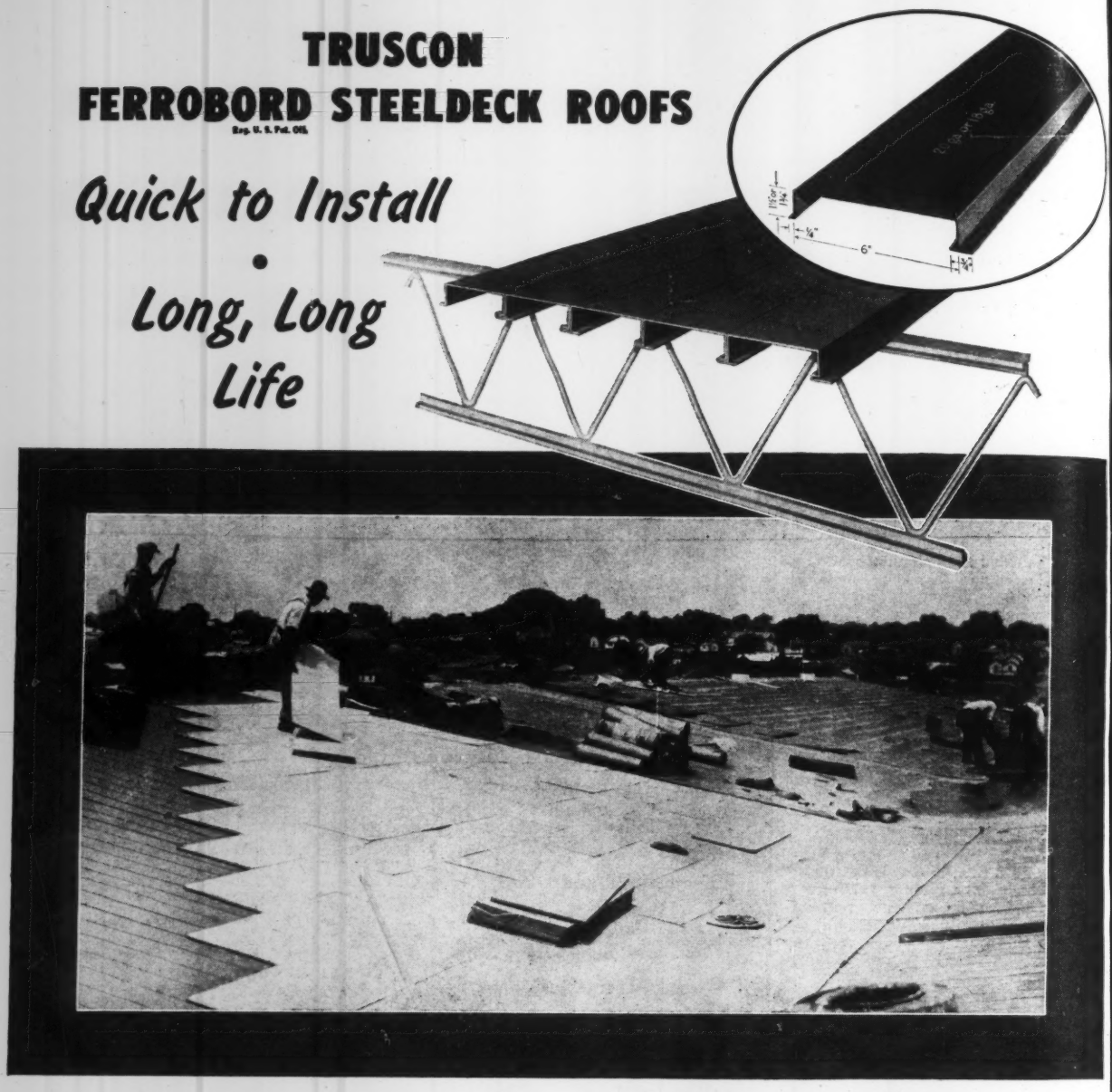

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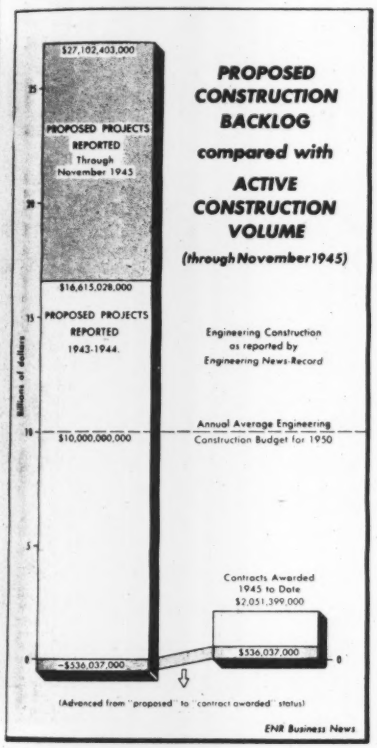
Construction Advances to Active Status

The cumulative proposed construction backlog measured from January 1943 through November 1945 is $27,102,403,000. This total remains after $536,037,000 worth of projects that have already advanced to active status of contracts awarded has been subtracted from the proposed construction backlog. During the first eleven months of 1945, $10,487,375,000 in proposed construction projects were added to the measured backlog over and above the $536,037,000 that moved out of proposed and into contract awarded status. This $10,487,375,000 in proposed construction projects for an eleven month period can be compared with the amount added during the twelve month period in 1943, $5,101,089,000, and in 1944, $11,513,939,000.

Breaking down the $27,102,403,000 backlog geographically, the Middle Atlantic states lead with their $6,825,982,000 forming 25 percent of the country's total. The other sections follow: West of the Mississippi, 23 percent; Far Western, 21 percent; Middle West, 18 percent; Southern 9 percent; and New England, 4 percent. The proposed backlog for public construction, $23,281,355,000, is 86 percent of the total for the U. S., with earthwork and drainage, public buildings and unclassified construction the leaders by class of work. Private construction, totalling $3,821,048,000, makes up the remaining 14 percent of which commercial and industrial buildings are the leaders.

Of the $536,037,000 that has been advanced to active status during the eleven months of 1945, $274,077,000 has been in public construction and $261,960,000 in private construction. Geographically, states West of the Mississippi lead the advance to active status during the first eleven months of this year with $174,245,000 or 33 percent of the U. S. total. Other regions follow with: Middle West, 20 percent; Middle Atlantic, 20 percent; Far West, 16 percent; Southern 7 percent; and New England, 4 percent.

By class of work industrial building leads the advance to active status with $160,036,000 or 13 percent of its total backlog of $1,232,571,000.

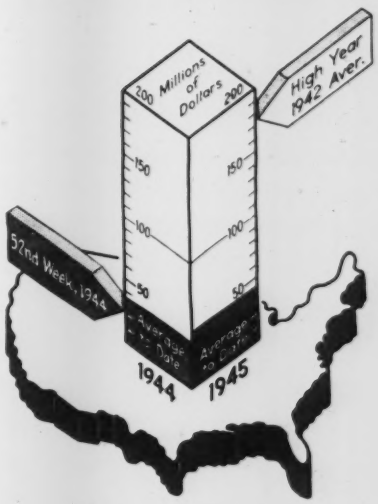


CONSTRUCTION ADVANCE TO ACTIVE STATUS—BY CLASS OF WORK

(Thousands of Dollars)

Class of Work	ENR Measured Backlog of Proposed Construction	% of total	Advanced to Active status (Jan. 1945, to date)	% of total	% of proposed advanced to contract awarded
Waterworks	$861,500	3	$22,940	4	2.6
Sewerage	1,493,918	6	11,456	2	.8
Bridges	1,128,219	4	4,295	1	.4
Earthworks—Drainage	6,867,796	25	23,048	4	.3
Streets—Roads	3,685,045	14	7,565	1	.2
Public Buildings	5,343,537	20	148,373	28	2.8
Industrial Buildings	1,808,555	7	53,762	10	2.9
Commercial Buildings	1,232,571	4	160,036	30	12.9
Unclassified	4,681,262	17	104,562	20	2.2
TOTAL, NOV. 30, 1945	27,102,403	100	536,037	100	2.0
Total, Dec. 31, 1944	16,615,028				
Total, Dec. 31, 1943	5,101,089				

CONSTRUCTION ACTIVITY



As Reported This Week to...
Engineering News-Record

CONTRACT VOLUME

(Three-day week)

Continental U. S. Only (Thousands of Dollars)

	Week of Dec. 27 1945	Cumulative 1945 (52 wk.)	Cumulative 1944 (52 wk.)
Federal	$6,906	$750,000	$1,118,613
State & Mun.	1,793	395,024	247,516
Total Public	8,699	1,145,024	1,366,129
Total Private	17,559	1,144,384	363,624
U. S. Total	**$26,258**	**$2,289,408**	**$1,729,753**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Type of Work	Dollar Volume (Thousands) This Week	Cumulative 1945 (52 wk.)	Cumulative 1944 (52 wk.)
Waterworks	$171	$61,039	$33,304
Sewerage	139	34,560	31,979
Bridges	6,155	53,080	16,566
Highways	1,220	227,258	195,716
Earthwork, Waterways	402	56,759	64,058
Buildings, Public	217	462,909	657,539
Industrial	4,466	635,162	174,314
Commercial	12,330	387,273	140,418
Unclassified	1,158	370,601	415,859

NOTE: Minimum size projects included are: Waterworks and waterway projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1945 (52 wk.)	Cumulative 1944 (52 wk.)
NON-FEDERAL		$450,141
Corporate Securities		112,919
State and Municipal	Data	192,282
RFC Loans	not	61,940
REA Loans	available	20,000
Fed. Aid Highway		63,000
FEDERAL		1,263,800
Total Capital		1,713,941

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Dec. '45	313.48	150.69
Building Cost	Dec. '45	240.82	130.18
Volume	Nov. '45	173	76

7 CONCRETE FACTS

About Air-Entraining Cement

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ENR-D-38

SUNDAY EVENINGS—*American Broadcasting Company (Blue) Network—U. S. Steel's "The Theatre Guild on the Air"*

The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • DECEMBER 27, 1945 • VOLUME 135 • NUMBER 26

Deficiency Bill passage spurs federal building

Veterans Administration to award $350,000,000 of work in 1946, big veterans' housing program to start, Army and Reclamation programs to be initiated

Passage of the first deficiency bill (H.R. 4805) for 1946, expected before the end of the year, will result in the start of a huge construction program by the several federal agencies provided with funds.

The measure as approved by the House and Senate (*ENR* Dec. 20, vol. p. 836) contains over $618,000,000 for construction and planning, and programs expected to total several billion dollars will be initiated with this money.

In its final form, the bill supplies the National Housing Agency with $191,000,000 for dismantling and reconstructing 75,000 temporary war housing units at new sites—exclusively for veterans' housing. The money will also be used to provide 25,000 dormitory dwelling units through conversion or reconstruction of barracks and other surplus military housing turned over to NHA.

During the last several months NHA has carried out extensive experimental work on how the war housing can best be dismantled and re-erected on new sites. This experience is expected to be so helpful that the housing agency believes contracts for most of the $191,000,000 can be awarded very soon.

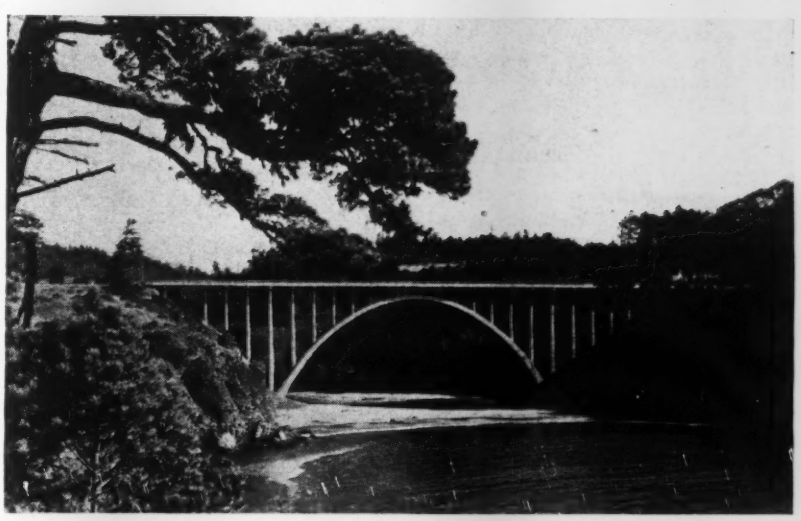
In constructing the housing units on the new sites, the cities, colleges, or others sponsoring re-use housing projects will be expected to provide the site without cost to the federal government. The sponsor will also finance construction of water mains, sewerage, and the other necessary community facilities. NHA will finance dismantling and re-erection work, as well as transportation operations. The cities will probably be required to sign agreements to tear down the housing after the emergency has ended.

The Veterans Administration is provided $158,320,000 for construction. Some $23,426,000 of this amount is earmarked for jobs already under way and can be obligated quickly. Since it has already had large construction programs authorized, the agency hopes to get $350,000,000 worth of construction awarded between now and Jan. 1, 1947—about $100,000,000 of it in the first half of the calendar year 1946. The great scope of this program is illustrated by the fact that from Jan. 1, 1937 to Dec. 1, 1945, construction placed under contract by the agency totalled only about $75,000,000.

Much Army work to start

The Corps of Engineers reports that the $123,175,000 of money in the bill for navigation and flood control work—including $82,659,000 for flood control general, $15,000,000 for the lower Mississippi, and $25,516,000 for rivers and harbors—will all be obligated within a few months. All of the funds in the bill were requested by the President as urgently needed at this time (*ENR* Oct 25, vol. p. 545). A considerable part of the money for the Army Engineers will be spent for projects suspended because of the war. These jobs will go

(*Continued on page* 38)



Pleasing lines specified for a park bridge

A reinforced concrete arch highway bridge across Russian Gulch in northern California was designed with special attention to the state park commission's requirement that it should have pleasing lines. With simplicity as a keynote the arch rib was given the single, smooth curve of an elliptical segment, a design developed by Henry E. Kuphal, associate bridge engineer, California Division of Highways.

The span is 240 ft. and the rise 85 ft. The approach spans, 122 and 164 ft. long, respectively, appear to be part of the main structure because thickened end columns were omitted. The deck is a continuous slab and the edge beam has a uniform depth of 18 in. Spandrel spacing at the crown is 16 ft.; this gradually increases to 20 ft. at the rib ends, and the column thickness similarly ranges from 18 to 24 in. The result is a smoothly uniform appearance very pleasing to the eye.

Extensive experience with structures of this type in California made it possible to build this one at a cost per square foot less than for any alternative type.

NEWS IN BRIEF

In telegraphic form, here are latest news developments on the engineering and construction front during the week.

Sewerage—*Miami, Fla.*, started action to condemn an 18-acre tract as site for the city's new disposal plant—part of a planned $17,500,000 improvement program. . . . *Paterson, N. J.*, started planning work for a $995,000 storm-sewer system. . . . *Sparks, Nev.*, surveyed its disposal plant, decided the 3,000-gpm. capacity would suffice for some years.

State Highways—*Utah* plans spending $19,000,000 for highway construction soon, according to Roy McLeese, chief engineer for the state road commission. . . . *North Carolina* will aim its future highway plans toward aiding growth and development of the state's municipalities. . . . *Wisconsin* announced its 71 counties will share $3,798,000 as their portion of 1945 highway taxes. . . . The *Tennessee* County Highway Officials Association, meeting at Knoxville, approved a plan setting up a secondary highway system to consist of 2,500 miles of state highways, plus 6 percent of the present county highway mileage in each county.

Freeways, parkways—Construction of the $22,000,000 Hollywood Freeway, to connect *Hollywood* and *Santa Ana, Calif.*, is expected to start by spring. . . . Also in California, the *San Diego* City Planning Commission submitted a plan for the establishment of seven major radial freeways and connecting belt routes to permit easy access to business areas of the city.

Bond Issues—*Tulsa, Okla.*, approved a $4,500,000 issue to finance new school system construction. . . . *Des Moines, Iowa*, approved bonds for a $2,750,000 war memorial auditorium and recreation center.

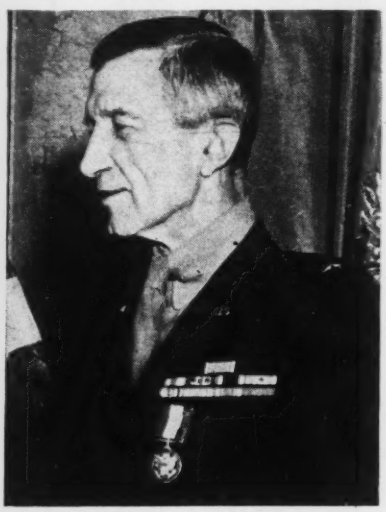
Construction—The Waterman Steamship Corp. said it would build a 22-story office building at *Mobile, Ala.* . . . Sears, Roebuck and Co. plans a $1,000,000 store building at *Portland, Ore.* . . . Reis Homes Inc., a New Jersey corporation, has announced a $9,000,000 small-home construction program to start in the spring at *Natick, Mass.*

Miscellany—*Oregon's* State Board of Aeronautics voted to engage an airport engineer to prepare a master plan for the state. . . . The U. S. Geological Survey opened offices at *Phoenix, Ariz.*, to begin a study of the state's ground water resources. . . . *Louisiana* planned to spend $5,000,000 on improvements to four of the state's six parks. . . . Army Engineers said dredges will soon begin work to clear silt deposits from the *Brownsville* and *Port Isabel, Tex.*, ship channels. . . . *Denver, Colo.*, approved a $592,000 outlay for water system improvements, including alterations to the filter plant.

Concrete Institute meet shifted to Buffalo, N. Y.

The 42nd annual convention of the American Concrete Institute, originally scheduled to be held Feb. 18-21 at the Hotel New Yorker, New York City, N. Y., has been moved to the Statler Hotel, Buffalo, N. Y., on the same dates.

Institute directors said unexpected difficulties in travel and in obtaining hotel accommodations had caused the change.



Brig. Gen. G. R. Young awarded DSM

Brig. Gen. Gordon R. Young, now engineer commissioner of the District of Columbia, and formerly commandant of the Engineer School at Fort Belvoir, Va. (ENR. Sept. 13, vol. p. 336), recently was presented the Distinguished Service Medal for his services as commandant of the school.

At the same ceremonies, Lt. Gen. Raymond A. Wheeler, Chief of Engineers, presented the following awards to other officers: Bronze Stars, to Col. Edward G. Herb, now assistant to the chief of civil works, Corps of Engineers; a bronze star to Lt. Col. Sidney C. Spring; and a Legion of Merit to Col. James P. LaCroix, fiscal officer of the Corps of Engineers.

Deficiency Bill Passage

(*Continued from p. 37*)

ahead as soon as plant, labor, equipment and materials can be mobilized.

Money for the start of one new job—$2,000,000 for Garrison Dam on the Missouri River—was stricken from the bill at the last minute, because Senate and House could not agree on the height of the structure.

Reclamation to go ahead

The Bureau of Reclamation, which will receive over $81,000,000 for planning and construction, and which has about $70,000,000 on hand from previous appropriations, plans to make a major start in 1946 on one and a half billion dollars worth of construction. Many of the projects for which money is now provided are already under construction or well advanced, and additional contracts can be awarded quickly to complete many of the jobs.

It is pointed out that something approaching $500,000,000 worth of work could be awarded in the calendar year 1947, if extensive unemployment makes this desirable. The great increase in these figures is revealed by the fact that the largest recent appropriation was in 1942 when the bureau was supplied with about $100,000,000. Before the war the average appropriation for the bureau was $60,000,000 to $70,000,000 yearly.

Other construction money in the bill that is expected to be used fairly soon includes $25,000,000 for the Public Roads Administration, to meet the requests of the various state highway departments for aid in accordance with the 1944 Highway Act; $5,575,000 for construction of a federal office building at Nashville, Tenn.; $3,998,000 for improvements at the National Airport, Washington, D. C.; and $6,400,000, including $6,100,000 in contractual authority, for sewer and public school construction in the District of Columbia.

The bill also includes $4,000,000 for the Department of Agriculture for forest roads and trails; $1,650,000 for an addition to the White House, and $1,878,420 for public works construction in the Virgin Islands.

Although the Senate had approved $25,000,000 for assistance to local public works planning groups, the final agreement on the bill calls for appropriation of only half this amount. This money will be made available through the bureau of community facilities of the federal works agency.

Additional details on how the funds provided in the bill will be spent are given in *Engineering News-Record* Dec. 20, vol. p. 836 and Nov. 30, vol. p. 751.

Reclamation Bureau plans $94 million Idaho project

A comprehensive report for Congress, outlining the Bureau of Reclamation's plan for development of an initial 230,000-acre unit of the proposed 400,000-acre Mountain Home project, near Boise, Idaho, was transmitted recently to Governor Arnold Williams of that state.

The project involves the importation of surplus water from the Payette River into the Boise Valley, and use of Boise River water released by this importation into the Mountain Home area. The multiple-purpose project, in addition to providing irrigation, will have capacity to produce 165,000 kw. of hydroelectric energy.

Cost of the entire development is estimated at $94,693,000, on the basis of 1940 prices. Two reservoirs and dams would be built, one to be called the Cascade reservoir, on the north fork of the Payette River, and another called the Garden Valley reservoir, on the south fork of the river. Surplus water from the Payette River, collected at the Cascade site, would be brought to the Garden Valley reservoir through a 4.6 mile tunnel and diversion works. From Garden Valley, the water would move either down the Payette River or through a proposed 54 mile Payette-Boise aqueduct of the Mountain Home project, which would deposit the water into the Boise river a few miles above Boise itself.

Transmittal of the report was made in accordance with the Reclamation law and flood control act of 1944, which required that the Bureau make available planning reports on potential projects to the governor of the state in which the project lies.

City's right to sewer levy upheld in Texas

The city of Waco, Tex., recently won a suit in the Nineteenth District Court for the right to levy a sewer tax on citizens.

The city filed the suit against W. L. Eason, president of the Waco Taxpayers Association, and nine other defendants, charging that they refused to pay a sewer tax, and asking the court for a judgment upholding the tax's constitutionality. The defendants claimed that the sewer tax ordinance—passed several months ago by the city council—is void, and that the rates are excessive and favor industrial, business and commercial users. Waco's sewer tax rates are based on the number of fixtures and type of building.

The court instructed the jury to return a verdict favoring the city. The court ruled that the whole sewer tax ordinance was valid except one section that gave the city manager the right to set the sewer tax rates of any firm that failed to come under the regular classifications of the ordinance. This section the court held to be unconstitutional, considering it an improper delegation of legislative authority.

The defendants in the suit filed notice of appeal to the Tenth Court of Civil Appeals.

Capilano Suspension Bridge at North Vancouver, B. C., one of the best known tourist attractions on the Pacific coast, has been sold by Henri Subeneau to A. D. McEachran for $120,000.

Calendar of Meetings

NATIONAL

American Road Builders' Association, 1946 annual meeting and convention, Stevens Hotel, Chicago, Ill., Jan. 14-17.

American Society of Civil Engineers, annual meeting, Commodore Hotel, New York, N. Y., Jan. 16-18.

Highway Research Board, Oklahoma City, Okla., Jan. 25-28.

Associated Equipment Distributors, 27th annual meeting, Edgewater Beach Hotel, Chicago, Jan. 28-31.

American Association of State Highway Officials, Oklahoma City, Okla., Jan. 29-Feb. 1.

American Concrete Institute, 42nd annual convention, Hotel Statler, Buffalo, N. Y., Feb. 18-21.

Associated General Contractors of America, Inc., Chicago, Ill., Feb. 18-22.

National Association of Home Builders' Exposition, Stevens Hotel, Chicago, Ill., Feb. 25-28.

REGIONAL

Illino's Contractors Association, Springfield, Ill., Jan. 7-8.

Kansas Contractors Association, Kansas City, Mo., Jan. 10-11.

Associated General Contractors of America, Inc., Kansas City Chapter, Kansas City, Mo., Jan. 16.

Wisconsin Road Builders' Association, annual meeting, Plankington Hotel, Milwaukee, Wis., Feb. 6-7.

Ohio Society of Professional Engineers, annual convention, Akron, Ohio, Feb. 14-15.

Minnesota Federation of Engineering Societies, victory convention, Hotel Radisson, Minneapolis, Minn., Feb. 21-23.

Michigan Highway Engineering Conference, Grand Rapids, Feb. 26-28.

Set ceiling on materials in New York area

Uniform ceiling prices on many building materials, to apply in New York City and Nassau County, N. Y., were set last week by the Office of Price Administration. The fixing of prices was aimed specifically at speeding small house construction.

The flat dollars and cents ceiling on some 33 "hard" building materials supplants a mark-up system that allowed price variations. OPA and industry representatives said that the ceiling would relieve the housing shortage by making it easier for builders to compute their construction costs in advance. The price-regulation will go into effect Jan. 1.

Leo F. Gentner, regional OPA administrator, said that similar ceilings on the same materials will be set soon for Westchester, Suffolk and other counties in the New York metropolitan area.

In general, the prices correspond closely with current prices for the materials as reported by *Engineering News-Record's* business news department.

The ceilings were listed at two levels, one figure for contractors, builders and carpenters, and another for retail sales to individual consumers. Some of the prices listed included:

Metal lath, ¾ lb. painted diamond mesh—28 c. and 38 c. per sq.yd.; portland cement, paper bag, 75 c. and 80 c. per 94 lb. bag, portland cement, cloth bags, 85 c. and 90 c.; high early waterproof cement, $1 and $1.20 per 100 lb. bag; vitrified clay sewer pipe, No. 1SS, 6 in., 29 c. and 31 c. per ft.; common brick, standard size, 4,500 and over $23 per thousand.

A.S.C.E. adds service for young engineers

Harrison D. Comins, Davenport, Iowa, will join the staff of the American Society of Civil Engineers, New York City, to take part in a program designed to render special service to the younger men of the profession.

Mr. Comins will be an assistant to William H. Carey, secretary and executive officer, to specialize in affairs pertaining to student chapters, local sections and technical divisions. He is 36 years old and received his B.S. and M.S. degrees at Lehigh University. He has had diversified engineering experience, including construction and research work, and has taught at the University of Missouri and Lehigh University.

Canada to build "prefabs" for Britain

Development of a new British Columbia business in the shipping of prefabricated housing materials to Great Britain has been inaugurated as the result of the signing of a contract by L. E. Farmer of The Burton and District Products Company Limited of England, with C. B. K. Van Norman, Vancouver architect, for the manufacture and delivery of an undisclosed quantity of prefabricated wooden components for the houses.

While the exact amount of the contract was not revealed, it is reported to represent an important part in the $47,500,000 housing program now being inaugurated in Great Britain. It is believed the manufacturing process will entail the establishment of either a new milling plant in Vancouver or the acquisition and expansion of an existing plant.

A leading exponent of the advantages of prefabrication, Mr. Van Norman said that types of homes to be built will differ considerably from those best known in American owing to the different housing habits of the old country.

Mr. Farmer is head of Burton and District Production Group, a consolidation of 20 firms which have played a big part in war construction in England and Scotland. It was prominent in making of "Mulberry," famed port constructed on the Channel coast for invasion of Normandy.

A total of more than 4,000,000 houses will be needed in Great Britain to repair bomb damage and meet the deficit created by the lack of building during the war years, according to despatches.

Low rent housing plan

While Canadian businessmen prepared to supply a part of the empire's housing needs, the problem of housing at home concerned the provincial governments. For example, a five million dollar low-rental housing scheme, one of the first of its kind in Canada, was approved by the city council of Toronto, Ont. Mayor Saunders was authorized to negotiate with the dominion government and that of Ontario for assistance in the plan, which calls for the erection of 970 housing units in the form of 2-story apartment blocks in a "marginal" area. About 650 houses would be demolished, but by using vacant land 550 new housing units could be erected without disturbing any of the existing residents.

The project would be built by Housing Enterprises Limited (*ENR* Aug. 2, vol. p. 137) a limited dividend corporation set up recently by life insurance companies in behalf of the dominion government. The necessary land would be turned over to the corporation by the city for one dollar. The cost of the land would be $1,600,000, of which the city and province expect to pay one quarter each and the dominion government, one-half.

To build storage basin for 500 surplus ships

A contract has been let at Wilmington, N. C., for the dredging of approximately 9,600,000 cu. yd. from the bottom of the Brunswick River to provide a basin for the storage of 500 surplus American merchant ships.

The storage basin will be 2¾-mi. long, 1,200 ft. wide, and between 10 and 13 ft. deep. It will be connected with the Cape Fear River by a 2,300-ft. channel, 13 ft. deep and 300 ft. wide.

Contract was awarded to the American Dredging Co. by the U. S. Maritime Commission. Work is scheduled to start around Jan. 1.

New "airline highway" proposed in California

A new "Airline Highway" to cost about $9,000,000, connecting San Francisco and Los Angeles, Calif., is receiving support from California groups who believe the new road would be safer and faster than the present coastal route 101 or inland route 99. The proposed highway would parallel flight routes of north-south airlines.

Large annual savings

Figures have been presented to prove that savings in mileage multiplied by the per-mile cost of operating vehicles, on a conservative basis of 200 passenger cars (6 cents a mile) and 100 trucks with trailers (25 cents a mile) per day on the new road would run to $655,170 annually.

Advocates of the airline highway state that they consider this saving would justify the proposed cost of construction of the highway.

Taking 72 miles from the coastal road length, and 25 miles from the inland route would make the proposed highway 395 miles long, and would develop an almost straight line artery between the metropolitan areas of San Francisco and Los Angeles.

Illinois water plant operators meet

New officers of the Illinois Water Plant Operators Conference pose for a group photo, after conclusion of their organization's 14th annual meeting recently at Springfield.

Highlight of the session was passage of a resolution favoring legislation to require licenses for water plant operators, and appointing a committee to work out provisions of a licensing law with the State Department of Public Health. At present, the department issues only certificates of competency to operators.

Left to right above are: G. W. Klassen, chief engineer, division of sanitary engineering, Department of Public Health; Irwin M. Craig, Zion, Ill., new chairman of the conference; Lewis S. Doren, Pekin, vice-chairman; Herman Garner, Benton, secretary, and W. J. Downer, assistant to Mr. Klassen.

Peru starts $50 million road program

Peru has embarked on a five-year highway construction program expected to cost over $50,000,000. Of this amount at least $10,000,000 will be used to buy roadbuilding equipment, much of it from the United States.

This large program was announced recently in Washington, D. C. by Eduardo A. Salgado and Juan Quiroga, assistant director and chief design engineer, respectively, of the highway department of Peru. The two men are spending several weeks in this country under the auspices of the Office of Inter-American Affairs, the Public Roads Administration and the American Road Builders' Association.

To add 3,000-mi. of road

They report that Peru now has nearly 20,000 mi. of highway and that by the end of the five-year program there should be 3,000 additional miles. More than three times the size of California and with a population of over seven million people, Peru has completed an all-weather road for the entire length of its portion of the Pan American Highway. About one-half of the 1,800-mi. route from Ecuador to Chile has already been paved with asphaltic concrete, and work in paving the remainder will be expedited.

Peru is also pushing a new highway eastward from Cusco in the "Alto-Plan", or high plateau region, toward the community of Maldanado on the upper reaches of the Madre De Dios River, a tributary of the Amazon. This road, in the face of great difficulties, has already been extended for 180 mi. into the eastern valley region as far as the river Inambara, and aerial surveys have been made for the remaining 125 mi. to Maldanado.

Another important highway now nearing completion is that leading from Nazca, a city on the Pan American Highway 290 mi. south of Lima, to Cusco, which is east of and 410 mi. from Nazca. This Nazca-Cusco highway, while not entirely completed, is now passable throughout. It shortens the distances between Lima and the important city of Cusco by 125 mi.

Long highway bridge built

The two men also reported that Peru is now completing the longest highway bridge constructed in the Amazon River basin. The structure spans the Aguayitia River and is part of the Ocean-to-Amazon highway in eastern Peru.

The bridge is a part of a highway that connects Lima, with an important tributary of the Amazon called the Ucayali. This highway crosses the main range of the Andes at an elevation nearly 16,000 ft., and makes possible quick and economical communication between the Pacific port of Callao and the rich, but until recently isolated, Upper Amazon Valley.

The bridge is 417 mi. from Lima and 106 mi. from the river port of Pucallpa, the eastern terminal of this highway. The two-lane structure is about 2,300 ft. long and consists of a suspension span of 560 ft., two steel-truss spans of 108 ft. each and 33 steel I-beam spans, each 46 ft. in length. The total cost of the crossing is estimated at $450,000.

Consider merger of roads-air commissions

Kentucky's State Aeronautics Commission may ask the 1946 General Assembly to consolidate the commission with the state highway department. Commission Secretary Phil P. Ardery said he believed the merger would provide a way for use of aviation gasoline tax for aeronautics.

West coast contractors get Navy surplus direct

Relief in the home-building tie-up for west coast contractors occurred recently when the 12th Naval District began direct disposal of various surplus materials, waiving authorization from the Bureau of Supplies and Accounts. Retail sales to any contractor are held at a maximum of $300, to allow for fair distribution.

Supply Corps offices are assisting local contractors in selection of such building materials as lumber, electrical supplies, plumbing, pipe, corrugated sheet metal, roofing, tar paper, nails, plywood, and celotex.

Besides the $300 restrictive, additional sales conditions stress that payment must be made by the contractor immediately upon delivery, with the certification that materials bought for new houses could not otherwise be obtained from commercial sources. Sales prices must not exceed market prices.

As a further move to relieve housebuilding curbs in the region, all supply depots and shipyards are declaring their surplus materials to local disposal agencies with the intent of unlimited sales at a future date on the same "over-the-counter" basis.

Ohio road department to use teletype system

A teletypewriter communications system linking the 12 Ohio State highway divisions, four regional offices and the testing laboratory with the central office at Columbus is to be installed as soon as teletype equipment is released from war service, Highway Director Perry T. Ford has announced.

Several months ago teletype printers were installed experimentally at the central office in the state office building at Columbus, at the department's testing laboratory at the Ohio State University, at Division 1 offices at Lima and Division 2 offices at Toledo. Teletype lines already used by the highway patrol throughout the state are to be utilized for the new communications setups, necessitating installation of new lines only to Lancaster and Newark.

"In view of the large program ahead, it is felt that the cost actually will be less to the state with this system than with the use of long distance telephoning," Mr. Ford said, "An added advantage is the fact that records will be made of all teletype messages for future reference. But the biggest benefit, as I see it, is the fact that laboratory test results can be flashed to the road or bridge building projects in hours instead of days."

Puerto Rico engineers ask probe by Congress

The governing board of the College of Engineers of Puerto Rico has adopted a resolution asking a Congressional Investigation into qualifications of a group of experts brought from the continential United States by Governor Tugwell's administration to occupy managerial positions in the industrialization program for the island. The resolution asked Congress to name an investigation committee to pass on the ability, experience and professional qualifications of these technicians.

This is the culmination of a series of protests from the engineering and other professional groups in Puerto Rico against the governor's recent address at the inaugural ceremonies of the College of Public Administration at the University of Puerto Rico, when Tugwell said that "managerial talent is lacking in the island". A one-day strike was held in San Juan under the auspices of the College of Engineers. Other institutions joined the protest.

At the meeting during which the resolution requesting a Congressional investigation was passed, the College of Engineers elected a new governing board to direct affairs for the coming year. Arturo Rómaguera of San Juan was named as president.

Los Angeles rushes to ease housing

Emergency housing to meet the critical Los Angeles, Calif., shortage—said to be the most acute in the country, is being rushed through financing phases by three governmental agencies, with a fourth expected to join in during January.

An independent agency, the American Red Cross, is already participating in an initial portion of the program. Conversion of buildings formerly used by the military, to house 300 families of war veterans, is in progress with some units already occupied. Costs of $200 per unit are being paid from a $60,000 grant by the Red Cross. The action is similar to moves already under way in New York State (*ENR* Dec. 20, vol. p. 831).

The Los Angeles County Board of Supervisors this week appropriated $100,000 for emergency housing, with allocation to be decided at a conference with the Los Angeles county housing authority.

The city council, likewise, has taken preliminary steps toward appropriation of $100,000 for emergency housing, probably also to take the form of conversion of military barracks buildings. An allocation of 3,000 units from the newly-authorized federal appropriation of $160,000,000 for veterans housing, to be completed within 45 days, will permit the city to use its $100,000 fund for non-veteran distress cases, it was predicted by the office of Mayor Fletcher Bowron.

An inquiry by Gov. Earl Warren, concerning Los Angeles' needs for state financial aid to meet the housing shortage probably will result in an appeal for $5,000,000 from the state legislature, which meets in special session on Jan. 7.

The emergency program, now rapidly approaching the action stage, is intended purely as as a stop-gap, to meet the critical needs in a temporary way until the permanent construction program can catch up with demand. Suburban Santa Monica already has under way a conversion program to prepare former military barracks for veteran use as temporary housing there.

Los Angeles' housing, short ever since the influx of war workers began in 1939-40, has grown acute with the return of thousands of veterans, and other thousands of war workers who left Los Angeles for extended vacations upon termination of their war jobs shortly after V-J Day. More than 1,000 dwelling units are soon to be razed to make way for construction of the Hollywood Freeway, adding that many families to the other thousands now seeking housing in Los Angeles and vicinity.

JOBS OF THE WEEK

RESIDENTIAL DEVELOPMENT, Philadelphia, Pa.

Louis Isard, Philadelphia, will construct a residential development by separate contracts. The estimated cost is $4,000,000.

BRIDGE, Florida

Cleary Brothers Construction Co., West Palm Beach, Fla., was the lowest bidder at $689,612 for a bridge over the Indian River, Brevard County, when the State Road Department, Tallahassee, opened bids. J. H. Dowling, Tallahassee, is the state road engineer.

WAREHOUSE, Minneapolis, Minn.

Madsen Construction Co., Minneapolis, will construct a warehouse by its own forces. The estimated cost is $600,000.

DISTRIBUTION WAREHOUSE, Minneapolis, Minn.

Sears Roebuck & Co., Minneapolis, awarded a contract to build a distribution warehouse and a mail order building to Madsen Construction Co., Minneapolis, at about $650,000. Magney, Tusler & Setter, Minneapolis, are the architects.

STORE, Minneapolis, Minn.

C. F. Haglin & Sons, Inc. will build a department store for The Dayton Co., Minneapolis, at about $1,000,000. Larson & McLaren, Minneapolis, are the architects.

MAIL ORDER HOUSE, Greensboro, N. C.

J. A. Jones Construction Co., Charlotte, N. C., has been awarded a contract for a mail order house by Sears Roebuck & Co., Greensboro, at about $2,000,000.

Note—Additional bidding and contract news on many projects large and small, including the above items, appear in the Construction News section beginning on page 129.

Open new bridge to Manitoulin Island

Manitoulin Island, one of the largest in the Great Lakes, at the head of Georgian Bay off Lake Huron, was formally linked by highway with the mainland on Nov. 28, when J. D. Millar, deputy minister of highways of Ontario, opened the new highway bridge at Little Current.

Highway connection with the mainland has been a local dream for the last half century. The new connection has been obtained by providing a highway flooring to an existing Canadian Pacific Railway bridge. Traffic lights and interlocking switches ensure safety in operation of the bridge for dual traffic. Conversion was undertaken by the Ontario department of highways.

Surplus equipment to be released by Army

Army officials have reported to the Senate Special Investigation (Mead) Committee that over $200,000,000 of equipment, including much construction machinery, has been declared surplus by the Army Service Forces. The A. S. F. also advised that another $200,000,000 worth of parts and secondary items will be immediately available as surplus.

Nearly $76,000,000 of Engineer Equipment has been declared surplus. Included on this list are road rollers, pavers, distributors, ditchers, cranes and shovels, scrapers, compressors and a long list of other general construction units. The Ordnance Department also listed numerous trucks varying in size from 1½ to 12 tons.

Ohio toll highway plan favored by Governor

Governor Lausche of Ohio said recently he had been asked to include in the matters brought before the General Assembly, if a special session is called. legislation to authorize the building of a toll highway in Ohio similar to the Pennsylvania Turnpike.

The governor, expressing approval of highways of this character, said that he would give "due consideration to the suggestion", if the anticipated special session is held.

"Most encouraging feature of such projects is that the ordinary user of the highways is not required to pay for its installation. Only persons using the highway pay the cost of financing it." the governor said.

Probe crash of train into New Jersey bridge

The federal Interstate Commerce Commission and the Public Utilities Commission of New Jersey late last week began formal investigations into the circumstances surrounding the crash of an interurban train into the descending center span of a lift-bridge over the Passaic River.

The accident occurred in the early evening of Dec. 17, when the train—a Newark-bound local of the Hudson and Manhattan Railroad—failed to stop for signal lights, crashed through a barrier, and hit the end of the lift-span as the span was descending into place after being opened to permit a tugboat to pass in the river. The first two cars of the train telescoped, killing the motorman and injuring 68 passengers.

Officials of the Hudson and Manhattan—a Pennsylvania Railroad affiliate—said on preliminary investigation that although there are no automatic stop devices on the track, a signal more than 100 feet from the bridge was set against the oncoming train, and a "crash board" warning device was also operating.

Boat wrecks Boston bridge

The bridge over the Charles River in the Charlestown section of Boston, Mass., was damaged and closed to train and automobile traffic for three days on Dec. 17, after the John Hathorn, a 10,000-ton freighter, heavily loaded with grain, rammed the partially-open swing span, causing a section 85x50 ft. to fall into the river and damaging the remaining roadway. The bridge carries the Boston Elevated Railway.

The vessel's superstructure plowed 25 ft. into the structure of the bridge before the ship was brought under control.

The bridge carries a peak traffic load of 17,700 passengers per hour. Temporary repairs will cost approximately $35,000. Two 85-ft. girders will be supplied by the Boston & Maine R.R., and a delay of several days before the bridge is re-opened may be expected.

California roads benefit from gas tax increase

James Quinn, of the state board of equalization, said that with the end of gasoline rationing, California's revenue from the gasoline tax has hit an all-time high. He reported a gain of 39 percent over volume for the month of September, 1944, with the distribution at the rate of 198,204,592 gallons per month.

Back to Civilian Activity

Capt. Phillip Adamo has returned to Springfield where he is working for the Illinois Department of Aeronautics as civil engineer.

M/Sgt. John Henderson is serving as general superintendent for the W. L. Cobb Construction Co. on the construction of a causeway across the Pasquotank River marshes between Elizabeth City and Camden, N. C., having recently received his discharge from the Army Engineer Corps.

John F. Berry has resumed his position as Tama County engineer at Toledo, Iowa, after discharge from the Navy.

Col. Dick Nelle has returned to the division of sanitary engineering, Illinois Department of Public Health, Springfield.

Maj. J. Matt Carr, former sanitary engineer at Belton, Tex., has been appointed city sanitary engineer of Waco.

After 43 months as a lieutenant commander in the Seabees, **George A. Barrett** is chief deputy in the county engineer's office at Dayton, Ohio.

Walter W. King, Jr., of Greensboro, and **Robert N. Hunter** of Charlotte, N. C., both former lieutenants in the Navy Civil Engineer Corps have formed a building contracting firm at Greensboro.

Lt. Comdr. L. L. Russell, with duties aboard a floating dry dock and on waterfront construction, Pacific area, has returned to Tidewater Construction Corp., Norfolk, Va., as a construction engineer.

Capt. George Hendricks, formerly in the Sanitary Corps of the Army, has returned to the Illinois Division of Sanitary Engineering, Illinois Department of Public Health, Springfield, as senior sanitary engineer.

Capt. Raymond N. Carlen, now on terminal leave, has returned to Rockford, Ill., after three and a half years overseas.

John F. Laboon, director of public works, Allegheny County, Pa., on leave to the armed services, has returned.

M. R. Whitmore, recently lieutenant colonel, Corps of Engineers, ETOUSA, has opened an engineering office at Atlanta, Ga.

Maj. W. C. Williams, soon will resume his duties as division engineer of the Oregon State Highway Department at Portland.

Carl O. Brownlee has resumed his duties in Shelbyville, Ill., as Shelby County superintendent of highways. He had served with the Army engineers for 18 months in the European theater.

John McIlarney, back after Army engineering service from Africa to the Pacific, is now general manager for M. Gammino Construction Co., Providence, R. I.

Maj. Charles R. Blood has resumed his duties as assistant city engineer of Sacramento, Calif.

Lt. Joseph Horner has resumed his work as city engineer of Marion, Ind., after service in the Navy.

Maj. J. C. Scallin, has been renamed to his former position as city engineer at Mitchell, S. D.

Maj. Rolf Eliassen, released from the Corps of Engineers, returns to New York University as professor of sanitary engineering. Major Eliassen was stationed at the American University in Biarritz, France, for several months, and prior to that served as sanitary engineer in both the New York and Salt Lake City division offices of the Army Engineers.

Charles E. Nelson, office engineer, and **Clifford N. Mitchell,** draughtsman, have returned from military service and have resumed their positions in the office of the city engineer, Springfield, Ill.

After service with the Corps of Engineers in Iran and in the Pacific, **Maj. Ralph H. Major** has become District 7 engineer of the Illinois Division of Highways.

Grover Clark of Rantone, Ill., on terminal leave from the Corps of Engineers, has been appointed assistant engineer for the Urbana-Champaign sanitary district.

Capt. Ralph W. Hardy has resumed his post as city sanitary engineer, Ft. Worth, Tex., after 42 months in the Army. He served as commanding officer of a malaria control unit in Australia, New Guinea and the Philippines.

Lieut. Andrew K. Richardson, USNR, is preparing to resume his duties as city engineer at Helena, Mont.

Charles Ames, recently discharged from the Army, has been named city engineer for Holly Springs, Miss.

OBITUARY

James B. C. Lockwood, 82, Seattle, Wash., a consulting engineer specializing in dredges and dredging, died Dec. 1. Born in Marshalltown, Iowa, he was graduated from Ames College and moved to Seattle in 1885, where he became associated with the late John McMullen and George W. Catt in opening the Seattle office of the San Francisco Bridge Co., later the Puget Sound Bridge & Dredging Co., with Mr. Lockwood as its first president. He left that company in 1889 to become manager of the port of Portland, Ore. Mr. Lockwood later organized the Drummond Lighterage Co. and served as its president until 1922.

William Edward Rowan, 52, consulting engineer at Fayetteville, N. C., died Dec. 12. He was a native of Everett, Mass., and a veteran of World War I.

Bryant M. Potter, 55, civil engineer at New Bern, N. C., for the last 32 years died Dec. 12. A graduate of the North Carolina State College school of engineering, he was in charge of the drainage of Mattamuskeet Lake in North Carolina, and for a number of years was connected with the Atlantic and North Carolina Railroad.

Ralph C. Miller, 76, controller of the Pennsylvania Railroad, died Dec. 11, in Philadelphia, Pa. He was graduated in civil engineering in 1901 from Ohio State University, and began his railroad career immediately with the civil engineering department of the Pennsylvania. He had served as superintendent of the Southwestern division at Indianapolis.

Richard C. Gibson, 34, formerly of Mt. Vernon, N. Y., died Dec. 5, in Springfield, Ill. He was a civil engineer graduate of Cornell University.

Arthur A. Mannis, 69, for the last 35 years a railroad and highway construction contractor at Edmonton, Alta., died recently at White Rock, B. C.

Julius C. Walter, 81, retired builder and contractor of Wichita, Kans., who in his residence of 59 years in that city, erected scores of churches, schools, public buildings and residences, died Dec. 11.

F. L. Bond, 68, a civil engineer who had long specialized in railroad work, was at one time chief engineer of the Grand Trunk Railroad, and who retired last year as vice-president and general manager of the Canadian National Railways, died in Montreal, Que., on Dec. 9.

Thomas J. Madigan, Sr., 67, superintendent of construction for the engineering department of the city of Columbus, Ohio, died Dec. 12.

E. W. LaPlante, engineer in charge of the moving of Shawneetown, Ill., in 1937 from the banks of the Ohio River, where the small county seat town had been repeatedly flooded, to a site three miles inland on higher ground, died Dec. 12.

Lieut. Col. Edward J. Langford, 78, retired civil engineer died in New York City Dec. 19. Born in Montreal, Que., in 1888 Colonel Langford helped survey a West Virginia branch for the Baltimore & Ohio Railroad. Later he was employed by the West Virginia Central, surveyed for the Maryland & Pennsylvania and became assistant engineer on the Baltimore division of the B & O. He became associated in 1909 with the New York, Westchester & Boston Railroad, an electric line which formerly operated in The Bronx and Westchester County, N. Y.

MEN AND JOBS

William G. Grove, after nearly five years in war work, has resigned as bridge consultant to the U. S. Engineer Board, Fort Belvoir, Va., to become engineer of bridges and structures of the Connecticut State Highway Department, succeeding **Leslie G. Sumner,** who was recently appointed director of engineering and construction. Mr. Grove's long experience includes service with: American Bridge Co.; Robinson and Steinman, consulting engineers, New York City; the Connecticut highway department. He was in charge of the design of the bridges over the proposed Florida Canal, with the U. S. Engineers at Camp Roosevelt, Fla., 1935-36, and from there went to Mexico City on the design of bridges for southern Mexico, 1936-37. He was again with the Connecticut highway department 1937-41 as associate highway engineer, from which position he went on the war construction program, first as chief engineer of Zone I, Boston, and later chief engineer, Zone VII, Omaha. He became chief engineer of the Sioux Ordnance Depot in Nebraska and later chief engineer, Sunflower Ordnance Works in Kansas. In 1943 he became bridge consultant, first in the Office of the Chief of Engineers, Washington, and later at the U. S. Engineer Board, Fort Belvoir.

Leslie G. Sumner, West Hartford, Conn., formerly engineer of bridges and structures of the Connecticut Highway Department, has been appointed director of engineering and construction to succeed **John H. Smith,** who retires, Mr. Sumner joined the department in 1916. He supervised the design of Merritt Parkway and Wilbur Cross Parkway highway bridges, the Middletown-Portland Bridge, the Charter Oak Bridge, the Groton-New London Bridge and the Housatonic River Bridge. Formerly he was in the engineering department of the New York Central Railroad Co.

Charles Fox, Decatur, Ill., and New York City, has been named chief service engineer for the Marquette Cement Manufacturing Co., Chicago. He will have charge of the Indiana and Illinois area. Fox was with the Decatur city engineering department for 22 years, and was city engineer from 1938 to 1943. He was employed by the G. A. Fuller Construction Co., New York, for the construction of the Houdaille-Hershey Corp. Garfield plant at Decatur, and later joined Warren & Van Praag, New York consulting engineers.

Several changes have been announced in personnel of the Washington state highway department. **J. R. Tillman** has been named acting district engineer in charge of the Olympia district, with **Calvin S. Fox** as maintenance engineer and **J. C. Claypool** construction engineer in the same district. They replace George Mason, A. T. Marion and Roy L. Greene, respectively. **Richard Linton,** headquarters safety engineer, was transferred to Wenatchee as district maintenance engineer and **E. W. Elwel** was transferred from the Olympia district to headquarters as assistant state aid engineer.

J. H. Gill, a graduate of the North Carolina State College School of Engineering, has been named assistant to the chief engineer of the Seaboard Air Line Railway, Norfolk, Va. He has been division engineer. He joined the company in 1925 at Raleigh, N. C.

(Continued on page 84)

Comment and Discussion

Readers' opinions on matters that concern engineers and contractors

Engineer Training

Sir: The letter by Professors Scott B. Lilly and Samuel J. Carpenter in *Engineering News-Record* for Aug. 23, vol. p. 220, referring to your editorial of March 22, meets with a very sympathetic response on my own part. These two well-known educators have put the arguments against too great an increase in subprofessional education in a most clear and forceful manner. I feel that the points raised by them cannot be too strongly emphasized, if the good of the engineering profession and the greatest contribution which it can and should make to the community and the nation are kept uppermost in mind. My hearty thanks to both gentlemen for their timely and excellent presentation.

FRANCIS P. WITMER
Prospect Park, Pa.

Moment Distribution

Sir: I have found F. S. Merritt's articles (*ENR* Nov. 1 and Nov. 15, 1945) of considerable interest and value, and I wish to compliment the author.

Mr. Merritt indicates in his opening paragraphs that the moment distribution method is far from ideal. It is intensely practical, so much so that writers have hesitated to submit theoretical solutions that must compete with it. Readers usually prefer the solution they understand to one that must be studied. Mr. Merritt has a method of calculation that should compete successfully with all others that have been published up to the present time if the readers will study it carefully.

The ideas of Mr. Merritt are not entirely new although the writer has not seen them in print elsewhere. An associate of mine, Prof. Cunningham, and I have been teaching some of these ideas for some time. Of course, due to different personalities and interests, we placed a different emphasis on some of the subject matter. I mention this that you may see that I think highly of Mr. Merritt's paper and that others are studying ways of improving on the moment distribution method of solution.

The method of handling side sway is quite awkward but I can suggest no improvement, although I have given the matter some study.

It is hoped you will see your way to publish more articles like this one. I think Mr. Merritt has given the profession a valuable contribution.

J. CHARLES RATHBUN
Professor of Civil Engineering
The College of the City of New York
New York 31, N. Y.

Incorrect Formula

Sir: I note in checking over my article on "Column Stress by Successive Deflections" in *Engineering News Record*, November 15, that there is an error in the equation at the top left hand corner of page 93, below the fifth line. The expression

$$\frac{L^2}{\pi^2} \times \frac{P}{EI}$$

should read

$$1 = \frac{L^2}{\pi^2} \times \frac{P}{EI}$$

Note that the figure 1 refers to one, or unity.

L. T. WYLY
Associate Professor
Civil Engineering Department
Northwestern University
Evanston, Ill.

Driving Timber Piles

Sir: I was very much pleased with F. D. Hartford's article on timber piles, *ENR* Nov. 29, vol. p. 735. I have observed pile driving for over fifty years and I think Mr. Hartford has written the most sensible article on timber piles that I have ever seen. I have always thought that the empirical formulas for pile driving were nothing but bunk.

In 1892 I saw a number of spruce piles which an architect had ordered driven as a foundation for a heavy masonry warehouse at Constitution Wharf in Boston, Massachusetts. These piles were dug out when it was found impossible to drive them satisfactorily and underneath was found an old crib made of 16 x 16 timbers and filled with chunks of granite weighing up to a ton and a half. The piles were so badly shattered that they looked not unlike a corn broom.

In 1911 at Guantanamo Bay Naval Station we drove a pile 77 ft. long in 20 ft. of water, the pile going about 4 in. to a blow when driving was stopped. This pile was afterward tested with a 15-ton load and showed negligible settlement. At Conde Beach, Guantanamo Bay, we drove piles which stopped under the hammer at about 6 ft. penetration but with the aid of a jet were put down some 20 ft.

I also noticed in Mr. Hartford's article a paragraph on what we used to call "driving for the inspector". A good hammer man can stop the hammer so that it will appear to be hitting a very hard blow when in reality it hits a very light one.

Here in Florida we rarely use a hammer at all as the material is practically all sand and shell and it is impossible to drive with anything but a jet.

Please convey to Mr. Hartford my compliments on his careful observation and good sense.

CHARLES H. JOHNSON
Sarasota, Fla.

And Towels Are Scarce, Too!

Sir: Being ever on the alert to augment my meager fund of engineering knowledge, my eye was caught by the heading of the item reproduced below. I am sending it to you as of possible interest to the profession.

DRY FOUNDATIONS QUICKLY

Quick trick to speed the drying of rubberized foundations which do not open flat: After rolling in a bath towel, place it on another dry towel, and stuff with crumpled tissue. This raises the top half so that air can circulate through it.

B. MOREELL
Vice Admiral (CEC) USN
Bureau of Yards and Docks
Navy Department
Washington, D. C.

Possibly the lady members of the A.S.C.E. should be appointed a committee to report on this type of "foundation"—EDITORS.

EDITORIALS

VOLUME 135 NUMBER 26

December 27, 1945

Underground Oil Vaults

A DARING CONCEPT in subterranean construction was carried out by the Bureau of Yards & Docks in the oil storage project that put huge vaults deep in a rock formation beyond reach of aerial bombs, as described in this issue. A simple but ingenious expedient was making the first excavation, which was far below the surface, barely large enough for a dome 100 ft. in diameter. Concrete in the dome was then poured, supported on rock. After the concrete had set, excavation was continued until a great vault 250 ft. deep was opened up underneath each dome. Grout prestressing of the lining gave maximum stability, and a telltale system spotted the location of small leaks. Finally, hydraulic tests of bottle-tightness were so accurate that measurement in each vault was based on increase in volume of the testing water resultant from the warmth it absorbed from the surrounding rock. This job is an imposing one to add to the enviable wartime record of the Navy's Civil Engineer Corps, which through its contractors and Seabee forces carried out construction projects from the Arctic to the Tropics ranging in kind over a field as wide as civil engineering itself.

Surplus Construction Equipment

CONSTRUCTION EQUIPMENT is badly needed now and there will be an unsatisfied demand for many months to come because the producers are unable to get into full production due to various causes, chiefly lack of parts made by other manufacturers. Meanwhile, large quantities of surplus equipment are in the hands of federal agencies or in lease-lend stocks that can no longer be moved and, according to H. O. Penn, head of the Associated Equipment Distributors, only the Army Engineers have made a serious effort to release their unneeded machines. There is no reason why other agencies should not be equally active in this respect, and, as a first step, each might well be required to file with the Surplus Property Administrator a list of all equipment it has on hand, both surplus and what it considers necessary to hold, together with a statement justifying its conclusions. This could then be reviewed by the administrator's staff to determine its reasonableness. Probably the very fact that holders of equipment would be required to justify their positions would result in the release of a large amount. Mr. Penn suggests that contractors all around the country put this matter of impounded construction equipment up to their local congressmen, asking for action. Other means failing, such a procedure must be followed. Construction must not be stalled by lack of equipment.

Caveat Emptor

SURPLUS EQUIPMENT offered for sale by various agencies ordinarily is sold "as is, where is." So, a reasonably intelligent buyer sends the master mechanic to determine the cost of putting the machine in working condition. But, particularly with large or special machines, a question of general suitability also arises. Can these machines economically be adapted to the special and usually rugged service of construction? The best source of information on adaptability and cost of conversion is the manufacturer of the equipment and his well-informed dealers. To both of these, owner satisfaction with their equipment is more important than immediate profit. Their advice is usually available for the asking.

Sludge Tank Safeguards

EVERY ACCIDENT, properly analyzed, reveals lessons that may be applied to the prevention of future hazards. Thus, unfortunate as was the sludge tank explosion for the village of Herkimer, N. Y., its occurrence points up at an opportune time some suggestions for improvement in tank design and operation that might usefully be applied elsewhere. At this very moment scores of sewage disposal plants are being planned, and changes can be made with hardly more effort than an erasure on partly finished drawings. While there may not be complete agreement with Mr. Taylor's recommended design changes based on the Herkimer experience (see p. 77), his ideas are provocative. Furthermore, he speaks from the authoritative position of one who originally designed the tank, learned from first-hand observation what could happen under an extraordinary set of operating circumstances, and who is more than academically interested in providing safeguards against future faulty operation. His conclusions, which were speedily made available for publication at our request, will be studied and welcomed by the sanitary engineering profession.

Big Contractors, Little Houses

IN ALL THE DEBATE and discussion that the nation-wide housing shortage has engendered, from our legislative halls to the man in the street, one very potent question has yet to be asked: Why don't big contracting firms, who build dams, tunnels and factories, start to build houses? Paradoxically the President suggested one answer to this unasked question last week when he endorsed the idea of channeling fifty percent of all available materials into houses costing less than $10,000. At least, if that were done, contractors might well have to stop building dams, tunnels and factories. Whether they would start building housing is not so readily apparent. But outfits that could turn from dam building to ship building and from road building to cantonment and munition factories during the war would certainly be capable of and conceivably would be interested in house building if offered a chance for a fair profit.

Exploration of the possibilities of heavy construction contractors engaging in house building would seem to be worthwhile on the part of both government and the contractors themselves, considering the seriousness of the housing emergency. It is generally agreed that less than 500,000 of a needed three million housing units can be built next year, but all estimates include a good many thousand units that must be built slowly and inefficiently in small-scale operations and often by inexperienced newcomers to the ranks of the builders. Large contracting organizations with construction know-how conceivably could put speed and efficiency into house building, which is sorely in need of just such a combination to avoid disastrous inflation in housing costs.

Contractors not normally engaged in house building would do well to study its possibilities, and lend their counsel and perhaps their business and building talents to the solution of its problems. Government officials, who are crying for the solutions in fear of the political consequences of failure, would likewise benefit by giving some thought to attracting experienced contractors to take on, and even to promote, some big house building contracts. At least in that direction lies some positive action that might increase the number of houses built next year, whereas the all-too-common wringing of hands over the all-too-true fact that what we need is a revolution in house building practices does exactly nothing to meet the present emergency, which, in one way or another, must be dissolved.

No Automatic Prosperity

THERE is a general feeling extant that at some time in the near future a signal of some kind will sound and that a postwar prosperity-of-plenty will immediately swing into action. January 1 has been mentioned as a possible date, since everyone who has "an income tax excuse" for loafing now is supposed to go back to work then. The early spring is also given a halo of promise because, with its arrival, good construction weather begins.

Without doubt, both of these dates will see a stepping up in business activity, and for the reasons given, but the achievement of prosperity will require something more than the mere passage of time. There are problems to be solved, and aggressive action to be taken, at least in the construction industry, before it can be said really to be under way. Just waiting for a date to roll around, for example, will not provide needed clay products such as brick and tile; rather some one has first to decide whether high enough wages are to be paid to get people to make brick and then to work out means to absorb or pass along the increased costs. January 1 won't see an upturn in cast-iron pipe manufacture unless a similar wage-price impasse is solved; it won't be the signal for sufficient amounts of lumber to become available unless strikes can be settled and cutting stepped up in the woods; and this magic date won't cause jurisdictional disputes among labor unions from stopping jobs that manage to get started.

Even the coming of spring can hardly melt away with the snows the labor union rules that limit output—brick laid, plumbing installed, electric wiring pulled—beyond all reason and fairness; nor the building code provisions that favor particular materials or equipment at the expense of the owner; nor, finally, will it melt away the "jerry" contractor whose practices of short-changing on quality and blackmailing on prices will soon be familiar. All of these sore points and many more will require some positive ameliorating action before construction can move as we want it to. Prosperity can't be automatic. It must be worked for.

ENGINEERING NEWS-RECORD
Copyright, 1945, by McGraw-Hill Publishing Company, Inc.
WALDO G. BOWMAN, *Editor*. EDWARD J. CLEARY, *Managing Editor*. *New York:* V. T. BOUGHTON, H. W. HUNT, E. R. DENMARK, E. E. HALMOS, JR., T. D. MacGREGOR, H. P. ORLAND and F. S. MERRITT.
Chicago: H. W. RICHARDSON, J. R. CARR. *Washington:* A. N. CARTER. *San Francisco:* N. A. BOWERS.
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Altus Dam Rebuilt as Gravity Structure With Masonry Facing Used as Forms

Wayne S. Byrne,
Assistant Construction Engineer, Bureau of Reclamation, Altus, Okla.

***Contents in Brief**—Formerly a slab-and-buttress type structure, Altus Dam in Oklahoma has been replaced by a much higher gravity dam with a stone masonry facing. This stonework was laid up one course at a time and was used as a form for the concrete, thus limiting the height of each pour to about 20 in. The narrow width of the structure near the top resulted in a varied procedure in placing the mass concrete, which consisted of a lean mix with the cement content reduced about 30 percent by addition of an inert pumicite.*

REPLACEMENT OF ALTUS DAM in southwestern Oklahoma with a much higher structure required, under war conditions, the solution of problems not ordinarily encountered on this type of construction. The work was complicated further by a decision after construction was begun to build a concrete dam with stone masonry facing rather than an all-masonry structure.

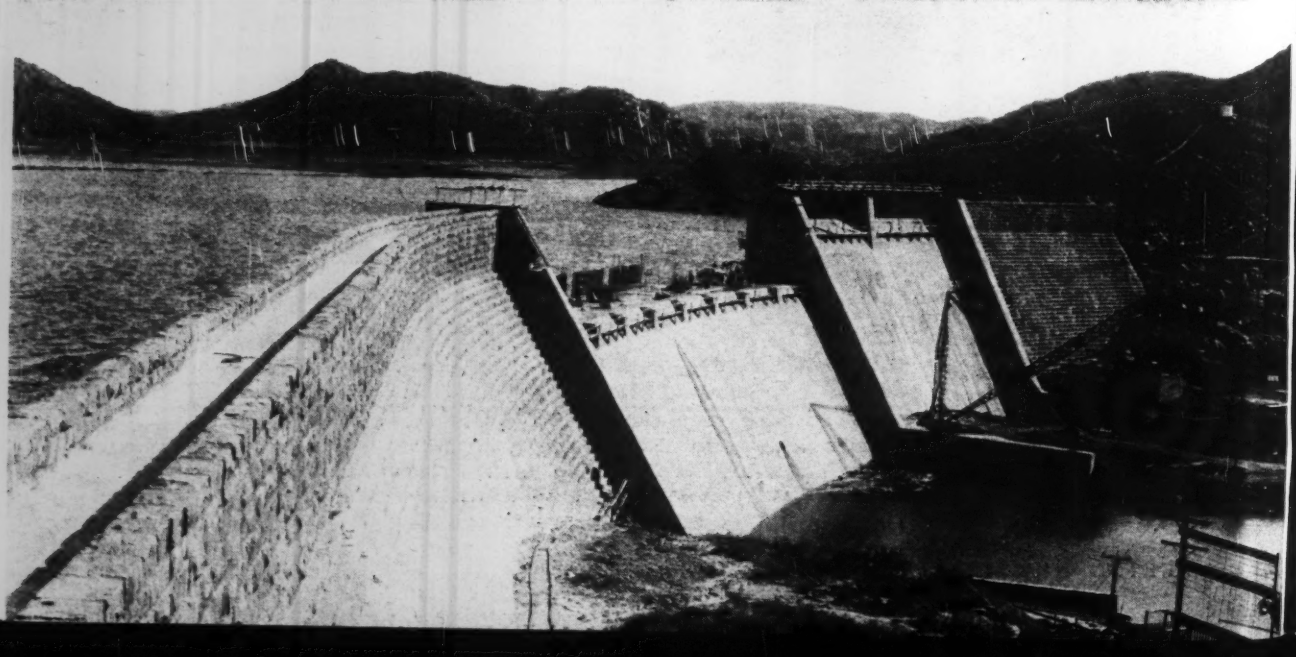
Built as the first project carried out in Oklahoma by the Bureau of Reclamation, the new structure spans the North Fork of Red River 18 miles from Altus, Okla., and immediately downstream from a low buttress dam built in 1927 as a municipal project to supply water for the city of Altus. It provides 152,000 acre-ft. of storage for irrigation of 60,000 acres of semi-arid land, for flood control and to supply water to the town of Altus. The original project was notable as the first and possibly the only Ambursen type dam to be built on a curve.

New construction was begun early in 1941 by the Bureau of Reclamation with participation by the Works Projects Administration, the WPA planning to supply unskilled labor and small tools and the bureau to furnish some skilled labor and all engineering and supervision. Since liquidation of the WPA in 1942 the bureau has performed all construction work.

In August, 1942, just before the work on the dam was to start, the War Production Board granted the priorities needed to complete the construction exclusive of irrigation features. In October of the same year the WPB halted all work, but in December the stop order was modified to allow construction to continue to sufficient height to replenish a seriously depleted water supply for the city of Altus and adjacent army installations, this work being completed in October, 1943. Later, or in April, 1944, the WPB, upon recommendation by the War Food Administration, granted authority for completion of the dam and distribution facilities to irrigate 20,000 acres by July, 1945.

Because of the long length of the new structure in relation to its height and the limited space for foundations, a straight gravity dam with a crest length of 1,104 ft. and a maximum

Fig. 1. Except for downstream face of spillway sections, the dam is faced with masonry, encasing lean concrete.



height of 97 ft. was found most feasible. To best fit the site, the central section of the structure was laid out on a radius of 487 ft. and the left abutment was designed to end as a reverse curve of 50-ft. radius extending into a tangent section about 350 ft. in length.

Masonry structure first planned

Originally, the dam was designed as a granite masonry structure throughout. This relatively outmoded type of construction was proposed in order to utilize the purported ample supply of WPA labor experienced in cutting and laying stone, and to permit a considerable saving of cement and lumber, when compared with an all-concrete dam. However, the labor supply proved inadequate and subsequently the masonry was eliminated except as a 20-in. thick granite facing for all upstream and downstream surfaces of the dam. An exception was construction of the downstream surface of the spillway section of concrete to give the proper hydraulic qualities.

The spillway, which has a total capacity of 60,000 cfs. with the upper pool level at El. 1564, is divided by a training wall into an uncontrolled section consisting of two 55-ft. openings with a crest at El. 1559 and a controlled spillway consisting of nine 21-ft. openings with their sill at El. 1547. Eventually 15x21-ft. radial gates will be installed to provide storage up to El. 1559 by controlling the flow over this portion of the dam.

Built in 20-in. lifts

Initially, only four contraction joints were provided along the dam, one at each end of the spillway section and one on each side of a canal outlet block. Because of the construction shutdown, provision was made for an additional contraction joint at each end of the controlled spillway from El. 1523 to El. 1547, or the crest of this section. Each joint is filled with asphalt in which steam pipes are embedded to permit the seals to be reliquified at proper intervals.

This wide space between contraction joints in combination with masonry facing called for more than ordinary care in construction to minimize cracking. Consequently, the dam was built in 20-in. lifts with the day shift generally placing the masonry and the night crews the concrete. A modified cement and a lean mix in which about 30 percent of the cement was replaced by an inert pumicite was used for all concrete in the masonry-faced sections. In the spillway section where the concrete was to be exposed, a minimum of 3 ft. of rich concrete (one bbl. of cement per cu.yd.) was placed against the forms.

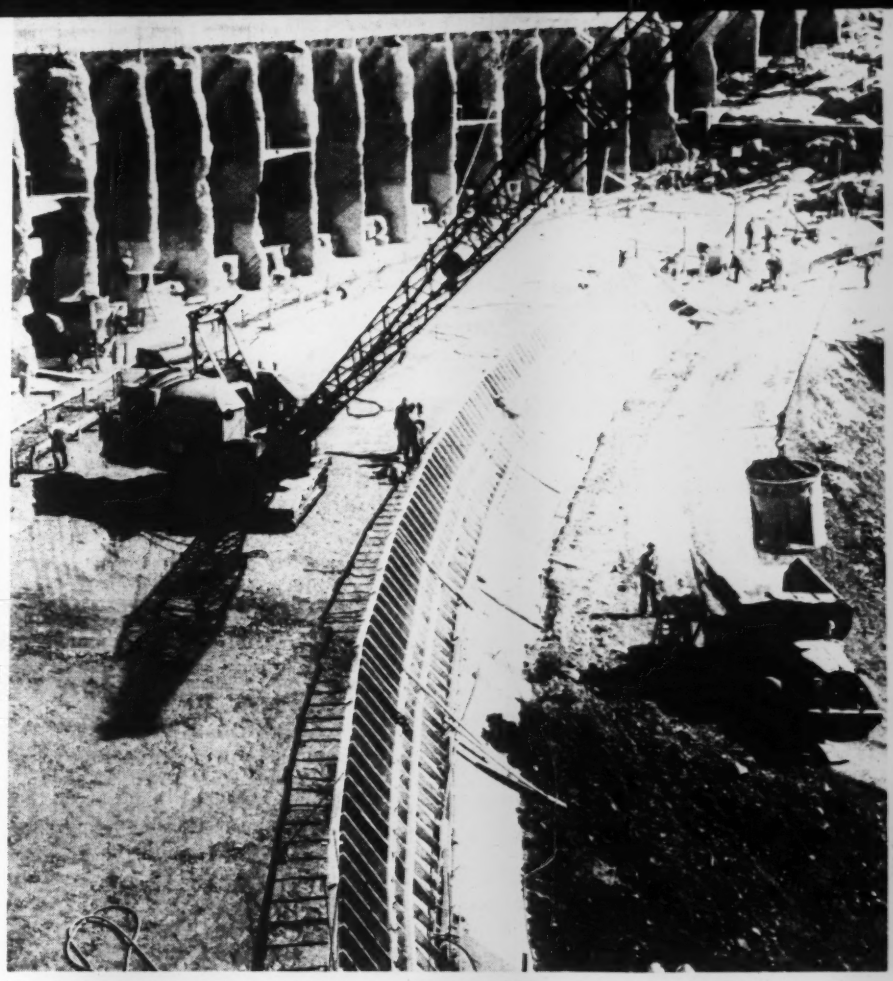


Fig. 2. Concrete for apron and base of spillway section of dam was delivered by truck in 2-yd. buckets to a crawler crane operating on concrete placed several days previously. Old dam, which was used as cofferdam, is shown beyond crane.

The use of pumicite to replace an equal volume of cement in the mass concrete had a twofold purpose. Primarily, the reduced cement content was intended to substantially aid in reducing the temperature rise of the mass concrete and thereby minimize cracking without the expense of artificial cooling. Second, since the major portion of the concrete was to be placed against granite masonry facing and consequently not exposed to weathering, the lean concrete would represent a considerable saving in cement.

Since 83 percent of the pumicite would pass a 325 mesh screen there was little difference in the workability of the "rich" and "lean" concrete, the latter developing an average compressive strength of 3,100 psi. at 28 days. The cost of the pumicite per cubic yard of concrete was about $0.25 which replaced an amount of cement costing $0.65, giving a clear saving of $0.40 on each cubic yard of lean concrete placed. No difficulties were experienced in handling the pumicite and no special apparatus was necessary.

Insofar as possible, concrete placing was confined to the winter months to eliminate the need for artificial cooling. Added control of temperature rise in the mass concrete was obtained by continuous spraying of each lift for at least 72 hr.

Old dam serves as cofferdam

The limited foundation area made it necessary to place the upstream face of the new dam within the area occupied by part of the old dam. Although this necessitated removal of the entire downstream apron and most of the supporting buttresses, it still was possible to use the existing struc-

ture as a cofferdam. To insure the stability of the old dam while it was acting as a cofferdam, the buttresses could not be cut back far enough to clear the new structure. Consequently, it was necessary to build the lower part of the face of the new structure around the buttresses, embedding them to a depth of about 6 ft.

Demolition of the old concrete created a problem. Drilling and blasting the old apron was too expensive, yet the sloping surface of the apron defied the use of a steel drop hammer and threatened to damage the boom of the crane handling the hammer. Finally, a granite stone worn to a pear shape from use as a drag on rip-rap slopes was tried. The abrasive granite prevented sliding and shattered the apron and the buttresses so completely that much of the apron reinforcing was salvaged for use in the new dam.

Numerous "pot-holes" full of river silt made the foundation clean-up difficult. Hand labor was the only satisfactory means of exposing the rock surface, but in spite of the scour from years of river flow, the granite foundation rock was extremely sound and required little excavation. Roughening of the smooth, water-worn surface with air-tools proved to be the most difficult work in preparing the foundation rock to permit concrete placing to start.

River diversion was through a channel excavated in the left abutment for the canal outlet works and wasteway. A portion of this channel is the site of the canal outlet stilling basin and the remainder will be used as a wasteway. An unusual feature of this work was that of providing support for the 24-in. wood-stave pipeline of the Altus water supply system. The pipeline crossed the channel at an angle that required suspension of 182 ft. of the pipe without benefit of piers.

Prior to excavating beneath the pipe, timber bents were constructed at either side of the channel, and cables parallel to the pipe were hung from them. Next, timber supports were forced under the pipe at 6-ft. intervals, the timbers subsequently being attached to the suspension cables by means of pre-cut suspenders and cable clamps. When all were so attached, the suspension cables were tightened uniformly by turnbuckles to support the pipe.

Excavation beneath the pipe was completed with a bulldozer and dragline.

Central mixing plant used

Volume of new concrete totalled only 60,000 cu. yd., which limited the type of mixing and placing equipment. All concrete and mortar was mixed in a central plant by means of 2-cu. yd. tilting mixers fed from a manually operated batching plant by a 135-ft. conveyor belt fed from hoppers.

The pumicite, a fine, white powdery material consisting almost entirely of pure silica, was mined and loaded with a bulldozer and hauled in trucks about 20 miles to the site of the dam. At the batching plant it was screened to remove lumps and weighed prior to being placed on the belt with the cement and coarse and fine aggregates, the entire batch being dumped into a charging hopper over the mixer. The aggregate stockpiles were located in a circle with a guy derrick in the center, permitting the derrick to place material in any bin with slight variations of the boom position.

Mixed concrete was dumped into a receiving hopper and then into 2-cu. yd. buckets and hauled to the dam in 13-cu. yd. bottom-dump trucks. This type of truck proved the fastest and most maneuverable of all the vehicles available.

As the major portion of the concrete was required for the spillway section, a system of ramps was built to permit trucks to deliver concrete for construction of a paved strip along the downstream toe of the dam sufficiently wide to accommodate a crawler crane equipped with a 90-ft. boom. Working on the paved area, the crane was able to place concrete for the entire spillway apron and the foundation of the dam proper.

When the spillway apron had been completed an earthfill ramp was placed across it, and the concrete and stone was placed by crawler cranes operating on mats along the top surface of the dam proper. This method became impracticable when the top width of the dam was reduced to less than 15 ft., thus making a third method necessary to complete the work.

For this latter method, a 4-cu. yd. dump truck, outfitted with a 3,000-lb. derrick and with the outer rear wheels removed to enable the vehicle to operate between the upstream and downstream stonework, was used to place the stone facing (Fig. 4). During

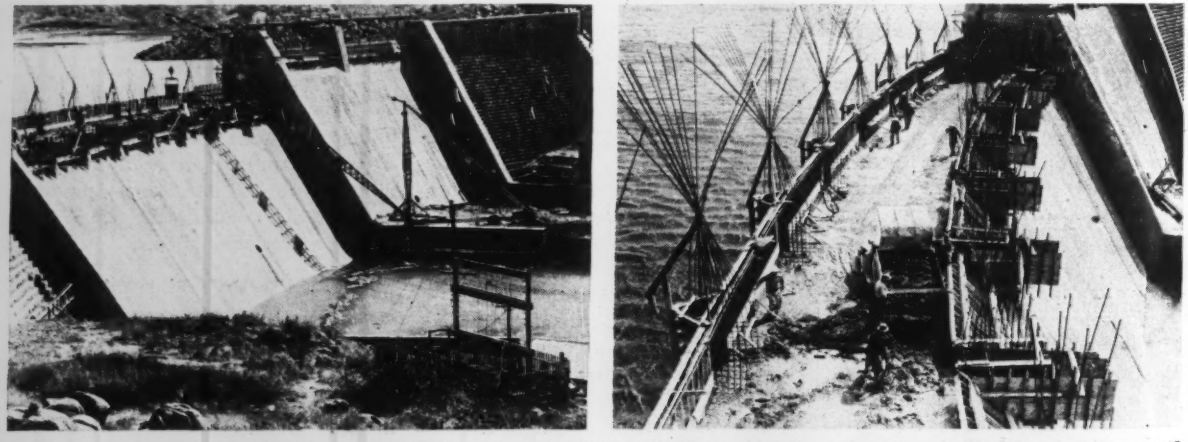


Fig. 3. Last concrete required for controlled section of spillway (left) was delivered with a bucket handled by a stiff-leg derrick. Right: The concrete was dumped into an end-dump truck for distribution to desired point along dam. Because pours were of low height no segregation occurred.

Fig. 4. After a thorough cleaning with a high-pressure water jet, the granite for masonry facing was set in layer of mortar with a rubber-tired truck equipped with a 3,000-lb. capacity derrick. When the mortar had taken its initial set, the joints were "wiped" with burlap to produce rough effect blending with the stone surface. All joints were broken and headers were placed at a maximum spacing of 5 ft.

this stage, concrete was delivered with a 2-cu. yd. dump truck equipped with special single rear wheels and oversize tires. A crane working at one end of the dam lifted 2-cu.-yd. buckets from below and dumped the concrete into the bed of the truck, which transported it to the required location. Since all mass concrete was placed in 20-in. lifts with a slump of 2 in. or less, no segregation occurred when the concrete was dumped from the truck.

When imbedded steel for the piers made the uncontrolled section of the spillway too narrow to permit passage of the truck, a temporary construction bridge was built above the spillway for delivery of the concrete. An old 3-cu. yd. concrete bucket was converted into a hopper and placed at one end of the bridge, where it could be filled by the crane. From the hopper the concrete was transported in buggies to trap doors spaced at 10-ft. intervals, below which were "elephant trunks" reaching to the surface of the dam.

Still more inaccessible were the controlled spillway and the eight spillway piers. To place concrete in these parts of the structure it was necessary to backfill in front of the uncontrolled spillway apron with earth to the top of the intermediate training wall. A crawler crane, operating on this fill and delivering concrete to the dump truck for distribution in the manner previously described, permitted construction to continue up to El. 1537, above which a stiffleg derrick with a 120-ft. boom was substituted for the crane (Fig. 3).

The work of completing the Altus Dam and a main canal 4.4 mi. long is being performed by force account. Morrison-Knudsen Co., Boise, Idaho, is constructing a 2,000-ft. siphon under the north fork of Red River.

The Altus project is under the supervision of the Bureau of Reclamation. During most of the construction period H. W. Bashore, was commissioner, Wesley R. Nelson, regional director, S. O. Harper, chief engineer and J. L. Savage, chief designing engineer. H. E. Robbins was construction engineer in direct charge. He was assisted by the writer as assistant construction engineer and by P. J. McGovern, construction superintendent; R. A. McCallum, assistant field engineer; and K. L. Powers, materials engineer.

Corrosion of Water Pipes Depends On Composition of Water

A comprehensive exposition of the effects of water on the pipes in buildings and the most effective modern methods of combating corrosion troubles has recently been opened at the Water Service Laboratories, 423 W. 126 St., New York City. Samples of corroded pipes taken from apartment houses, office buildings, hotels and hospitals furnish a graphic portrayal of the formation of corrosion products that clog pipes, restrict the flow of water, create expensive and dangerous leaks and discolor the water.

In addition to the display of old iron pipes, there is a unique array of yellow brass pipe specimens illustrating the corrosive effect of water on this material, which for many years was thought immune to attack.

Sponsors of the exhibit believe that this demonstration makes it plain that no metal is immune to corrosion and that the rate of corrosion depends principally upon the characteristics of the water involved.

In this connection, Henry L. Shuldemer, chemical engineer and president of the Water Service Laboratories, stated, "There is considerable difference of opinion with respect to the durability of pipe materials, but much of the conflicting testimony that has been reported about the same kind of pipes in different locations is due to the different composition and characteristics of the water supplies involved —a fact that has been completely overlooked too many times. It is not feasible to make general recommendations as to the best material to be used under all circumstances. Each individual case must be studied with particular reference to local experience and the composition of the water."

Deep Foundation and Welded Truss Feature Unusual Australian Bridge

***Contents in Brief**—A new Australian bridge has two 438-ft. through truss spans that are entirely shop welded, said to be the longest trusses in the world built by this method. The trusses rest on a pier, constructed by the open caisson method, that is within 8 in. of the deepest in the world. Built on soft ground, the caisson at one time took an unexpected "run" of 53 ft., dropping to 45 ft. below the water surface where it was salvaged by lowering another caisson over it. It required a total of five years to complete. For other foundations long concrete piles were driven until their tops were far under water and then a diving bell was used to build the piers to the water surface.*

THE HAWKESBURY RIVER in New South Wales, Australia, long known for its deep, soft-mud bottom and consequent foundation-building difficulties, has again been spanned, this time by a bridge in which one pier is more than 240 ft. deep and in which the two main spans are made of shop-welded trusses. The bridge is further notable for the use of a diving bell to cap some of the long piles in the approach spans. A highway crossing, it replaces an historic ferry on the route between Sydney and Newcastle.

According to information from a booklet prepared by the Clyde Engineering Co. Ltd., fabricators of the steel, and from an article by V. Karmalsky, designer of the bridge, which appeared in the March, 1945 issue of the *Journal of the Institution of Engineers of Australia*, the width of the bridge is 30 ft. to accommodate three lanes of traffic while a 6-ft. walkway is provided on one side. The structure is designed to carry a vehicle of 40,000-lb. weight on two axles in each lane and a uniform load of 70 to 100 lb. per sq.ft. over the area in front and behind the heavy load. The deck of the bridge is of reinforced concrete resting on steel stringers and is covered with 2 in. of bituminous concrete.

It is claimed that the 438-ft. trusses for the Hawkesbury River bridge are the longest in the world that have been completely shop welded, another step in a practice begun by the Department of Main Roads of New South Wales in 1934. Mr. Karmalsky, as engineer of the department, reports that experience has proved that not only is the weight of a welded truss some 20 percent less than a riveted one but that, on a basis of competitive bids, the cost is also 15 to 20 percent less.

However, riveting was used for field assembly. Despite a somewhat lighter weight, completely welded trusses are usually more expensive than a shop-welded field-riveted unit because of higher erection expense.

Although for a structure the size of the Hawkesbury bridge it was believed that field welding could be scheduled so the cost would be reasonable, other conditions favored riveting for the field connections. These conditions, as outlined by Mr. Karmalsky, are:

Butt-welding of complete members was undesirable for the large built-up sections, with plates up to 2 in. thick, as the webs would have been welded after the flanges, or vice versa, and the cooling stresses would have been dangerously high.

It was impossible, with the length available for connection, to develop the large members by fillet welding, even if very large fillets were used, together with big gusset plates. Fillet welds and closely spaced slot welds would have been required.

The large amount of field welding concentrated at the joints was liable to cause serious distortion.

A much more satisfactory design could be prepared by the method developed for the earlier small trusses—shop welding and field riveting. And riveted joints are much more convenient for erection than welds.

The 438-ft. spans are curved-chord through trusses with the top chord straight between panel points to make the section more economical and to provide a pleasing appearance. The type of bracing adopted is that known as the K-system, which is most appropriate for this length of span and depth of truss, resulting in comparatively short members that have a further advantage of reduction in secondary stresses. The heaviest members in the bridge, the sloping end posts, consist of two side or flange plates 30 in. wide and 2 in. thick with a web plate 12 in. wide and 1½ in. thick, joined by continuous welded seams to the side plates, the whole forming in cross section the letter H.

In welded structures, the H-shaped section has many advantages com-

RAILROAD BRIDGE NEARBY

- Just a short distance up the Hawkesbury River from the current work, a double-track railway bridge was built in 1886-1889. It has five 416-ft. and two 408-ft. pin-connected truss spans supported on piers sunk by open caisson dredging through 47 ft. of water and as much as 108 ft. of mud to reach the then unusual depth of 155 ft. below the water surface *(Eng. News*, Feb. 13, p. 98, May 8, p. 298, 1886).
- This early structure is now being replaced by a similar truss bridge with two 450-ft., four 350-ft. and two short steel spans. One of the principal piers is 183-ft. deep. To avoid falsework in the deep water, trusses for both the early bridge and the current one were constructed on shore and floated to position. The early bridge was designed and built by Union Bridge Co. of New York while present work is being done by the New South Wales Railway Dept.

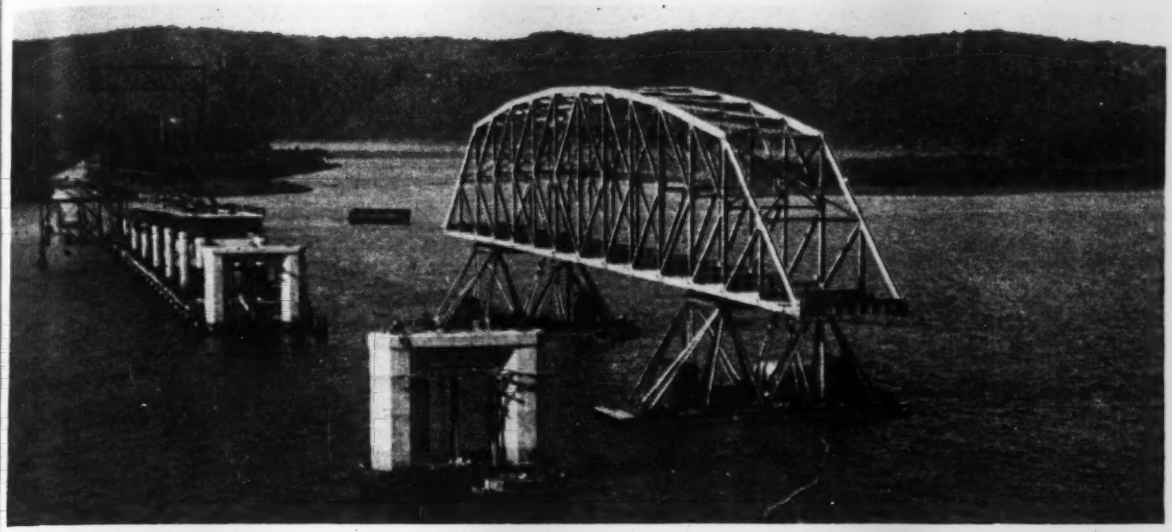


Fig. 1. Advanced Australian design is shown by this 438-ft. truss in which all major members are built up by welding.

pared with other built-up sections. It is symmetrical about both axes and can be designed with the same rigidity about both axes if required. It is convenient for riveted connections and, having the bulk of the material in the flanges, can be riveted by the flanges only, leaving the web plate unriveted. Also, it does not require lacing nor diaphragms.

The H-section is not suitable for horizontal members as it forms a trough for collection of water and for this reason the horizontal bottom chord has been designed as an inverted U-section. This U-section, however, is less economical since it requires six rows of welding, and a few diaphragms, while the H-section is built with only four rows of welding and does not require diaphragms.

Welding difficulties

Some "dishing" of the web plates of the H sections occurred due to welding on only one side of the flange plates connecting the web. It was found that this condition could be corrected by clamping each flange plate down on the welding table with packing opposite the web plate to produce a "dishing" condition in the opposite direction. As an example, in the welding of a diagonal member with flange plates 16 in. by $\frac{7}{8}$ in., a packing strip $\frac{3}{16}$ in. was successfully used.

Such dishing was used for all of the H sections except the top chord members. It was believed that the flange plates of the top chord were too thick to be affected by fillet welding of the web plates and also too thick to be pre-bent in a jig. However, the flange plates of the top chord members did dish about $\frac{3}{16}$ in. in the 30x1¼-in. plates and $\frac{1}{8}$ in. in the 30x2-in. plates.

Although this distortion is well within the 2 percent frequently allowed for rolled angle sections, it caused some trouble in erection. Mr. Karmalsky believes the pre-bending could have been done by use of 1½-in. bolts at 12-in. intervals and the dishing avoided.

Mr. Karmalsky also stresses the desirability of rolling special flange plates, with a protrusion in the middle, for the manufacture of H-sections and plate girders. The web plates would be welded to the protrusion on the flange plates and would thus do away with the dishing of the flange.

The 90-ft. plate girder approaches to the main span each have two main members, 7 ft. 3½ in. deep, and of normal type except that welding was used in their fabrication with heavy plates, up to 2 in. thick, butt welded for use as flanges. These were shop assembled and delivered in one piece. The eight 40-ft. spans over the shallow water at the northern end of the bridge were rolled sections.

The pier supporting one end of each of the 438-ft. spans was unusually difficult to build due to the great depth of soft material encoun-

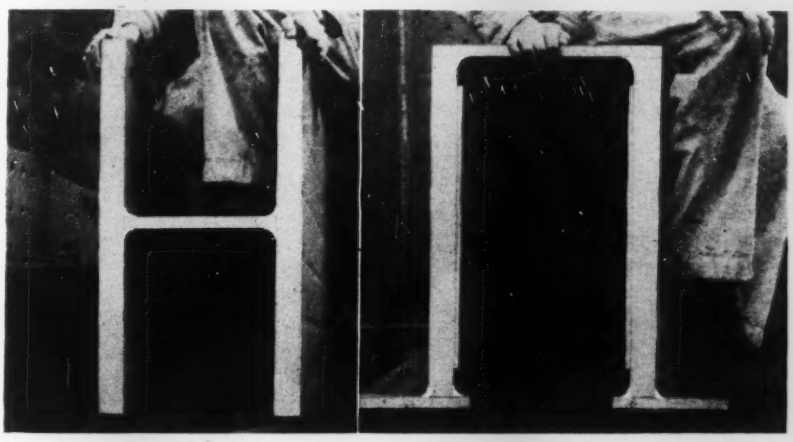


Fig. 2. H-section, left, for top chord and end posts of truss span are built up of side plates as heavy as 30x2 in. with web 12x1½ in. At right is inverted U-section, made up of side plates as large as 24x1¾ in., flanges 8x⅞ in. and a top plate 16x⅞ in. Photos are retouched to emphasize welds.

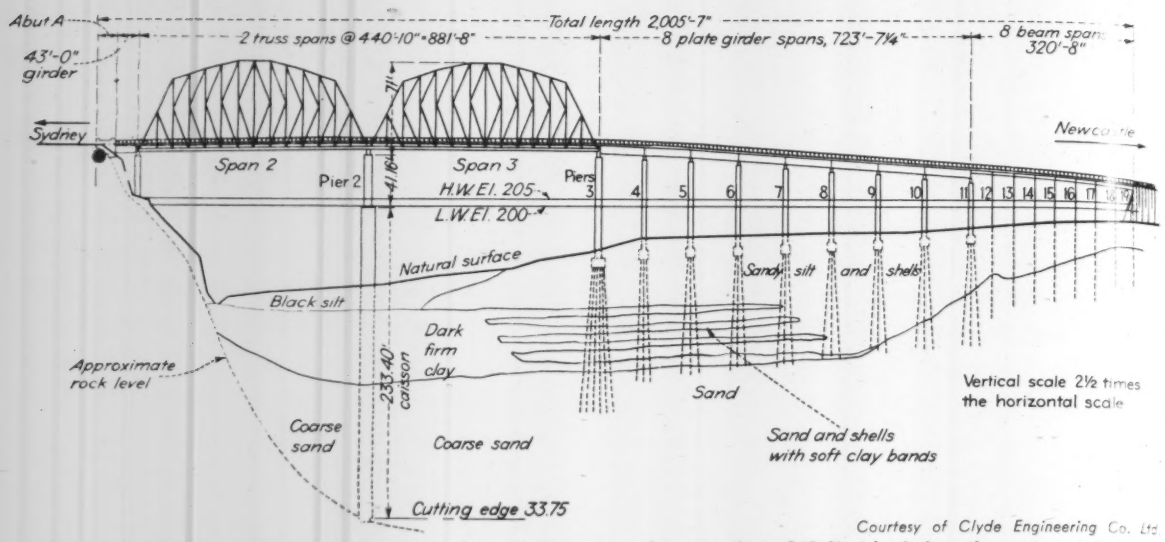


Fig. 3. Foundation materials in the river are such that one pier extends to 241 ft. 4 in. below the water surface.

tered. It was constructed as an open caisson and was sunk 241 ft. 4 in. to bedding on solid rock, only 8 in. less than the world record depth of one of the piers sunk for the San Francisco-Oakland Bay Bridge, *ENR*, Aug. 23, 1934, p. 227.

Unexpected submergence

At a time when the cutting edge had progressed to 50 ft. below the bed of the river and the shell had been built up to 129 ft., the caisson took a "run" of 53 ft., dropping exactly vertical to a position such that the top of the caisson was 45 ft. below the surface of the water. This mishap presented a problem new to engineering practice but which was met by building another section of caisson, floated in a manner similar to the original, and landing it on top of the sunken section. The two sections were joined together with reinforced concrete.

Before additional excavation was undertaken, the shell was extended to make it 199 ft. long. Later the caisson again took a run of 30 ft. but the possibility had been foreseen and the shell extended high enough that little difficulty was experienced. Still later the caisson took a final run of 28 ft. resting on boulders at a depth of 230 ft. below low water level where it was left permanently.

The bottom was cleaned of mud and silt by an air-lift pump. The boulders were removed by explosive charges that varied in quantity from 1 to 5 lb. of blasting gelatine. The charge, after ignition of the fuse, was dropped 230 ft. through a 4-in. pipe into a hole bored in the rock.

To seal the caisson a plug of concrete about 26 ft. deep was placed under water by bottom-dump buckets. The pier was later built up to a total height of 282 ft. above foundation, requiring 5,324 cu. yd. of concrete. Construction of the pier required five years from the time the cutting edge was first laid out until it was completed. A year was lost in making new connections to the caisson after its first "run".

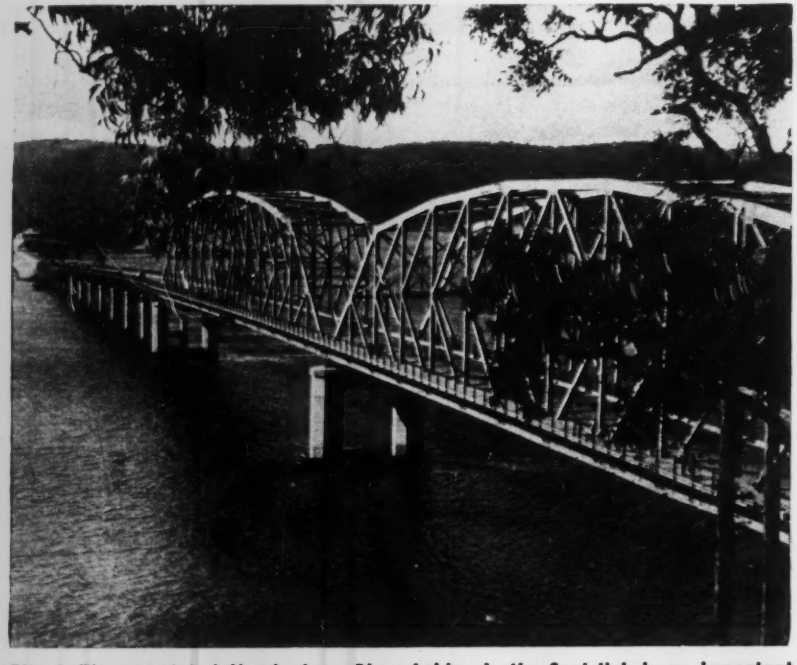


Fig. 4. The completed Hawkesbury River bridge is the final link in an important Australian highway.

Diving bell aids pile connection

Piers 3 to 11, Fig. 3, were a different type of foundation, each being set on concrete piles driven deep into the river bed and then capped under water and shafts built up to carry the superstructure. The silt of the river bed was excavated for a depth of 20 ft. inside a steel sheetpile cofferdam and the piles driven so that their

tops were about 6 ft. above the bottom of the excavation.

The piles used were 20 in. square and varied in length, for the different piers, from 83 to 110 ft. with one 120-ft. test pile driven in Pier 3. The piles weighed up to 24 tons each and had to be handled very carefully. They were placed horizontally in leads that could be turned into the vertical position necessary for driving. Driving was accomplished by an 8-ton hammer using a follower to drive the piles far under water, in one case to 50 ft. below the surface. These are believed to be the longest concrete piles that have ever been driven so far below water. Pier 3 has 72 such piles in the foundation while a total of 348 piles were driven in piers 3 to 11.

The bases of piers 3 to 11 were built over the tops of piles inside a diving bell, a large welded steel working chamber, securely anchored to the foundation piles by a concrete seal poured under water. The working chamber was filled with compressed air, which displaced the water and allowed all work to be carried on in the dry. Access to the diving bell was through air locks, the concreting of the base being completed without disturbance from the water. The diving bell used for Pier 3 was 51½ ft. by 30 ft. by 15 ft. high and weighed 40 tons.

Piers 12 to 18 of the bridge consist of six reinforced concrete piles with reinforced concrete caps poured at their top to carry the superstructure. The piles were 22 in. square and the longest, 102 ft., weighed 26 tons. The outer piles of the piers were driven on a batter of 1 in 12 and the others vertical.

Truss span floated to position

Because of the great depth of water at the section of the bridge where they are located, the two 438-ft. spans were erected on pile falsework at the shallow side of the river, then floated on barges into place and lowered on the piers, Fig. 1.

A traveling gantry, 90 ft. high to clear the 71-ft height of the truss span, was erected on the timber falsework. This traveler was made to handle the heaviest piece of the truss span, 22½ tons, and lift it into position 110 ft. above water level.

The spans were erected at about the slope at which they would finally be set and to the required camber. Two barges 100 ft. by 30 ft. by 9 ft., 400-ton capacity, on which suitable towers had been erected, were floated in at low tide and with the rise of the tide the span was lifted off the erection falsework and hauled clear. On the next tide the span was towed to position between the piers, located over the bearings and as the tide fell the span came to rest on the bearings, a spectacular operation in handling a weight of 640 tons.

The 90-ft. girder spans were fabricated at the shop and delivered to the site, in one piece. They were transferred to barges and lifted into position by a shear leg derrick. A crane placed the steel floor system—a complete span weighing 54 tons, being erected in a day.

The contract for fabrication of all the metal work on the bridge was let to the Clyde Engineering Co. Ltd. for £95,000 (current U. S. exchange $3.25). Construction of the substructure and erection of the superstructure of the bridge were done by Dalgue Construction Pty. Ltd. for £247,000.

Illinois State Water Survey Completing Half-Century of Service

A half-century of ever-expanding service is being completed this year by the Illinois State Water Survey, located at the University of Illinois. This year also is the twenty-fifth in his post for chief of the survey, A. M. Buswell.

Typhoid epidemics sweeping Illinois every ten years, with the worst in 1893, led to the origin of the survey. In 1895 the university's chemistry department undertook the responsibility of analyzing water supplies in the state, to trace and prevent future epidemics.

Early interest was in analyzing and establishing sanitary standards for drinking water. The extent of the work grew rapidly. In 1911 the state legislature appropriated funds directly for a State Water Survey, enabling extension of work to other problems such as water softening and treatment, stream pollution and the beginning of an inventory of Illinois water resources.

Engaged in sewage research

In 1914 research in sewage treatment began. Prof. Edward Bartow, then survey director, was among the pioneers in bringing the modern activated sludge process to attention and acceptance. Sewage treatment studies have constituted an important part of the survey's work.

State administrative reorganization in 1917 transferred the Water Survey from the University to the Department of Registration and Education, but its location continued in the chemistry building at the university.

The study of water resources began in 1911, was expanded in 1922 and today is one of the most important contributions of the survey, involving collection and publication of information about both well and surface water supplies throughout the state. The drought of 1936 and wartime industrial needs for water have brought these studies to the foreground.

Had active war program

War and changing municipal needs have focused attention not only on adequate water supplies for the present and future, but also on water quality and softening methods. During the war the chemical staff of the survey has cooperated with the university and the Army in developing weapons for detecting and counteracting poisons in water.

Postwar developments in municipal and industrial expansion, flood control, regional area development and similar projects are bringing ever increasing value to the information the Water Survey has collected and developments it has produced, as well as new problems for its staff to solve.

The staff ready to handle new problems now numbers thirty, including several on military leave, and the biennial budget totals $250,000. A building with suitable quarters is in the state's postwar plans. Present quarters in the university's Noyes Chemistry Laboratory have been occupied since 1916, when the staff numbered eight and the biennial budget totalled $60,000.

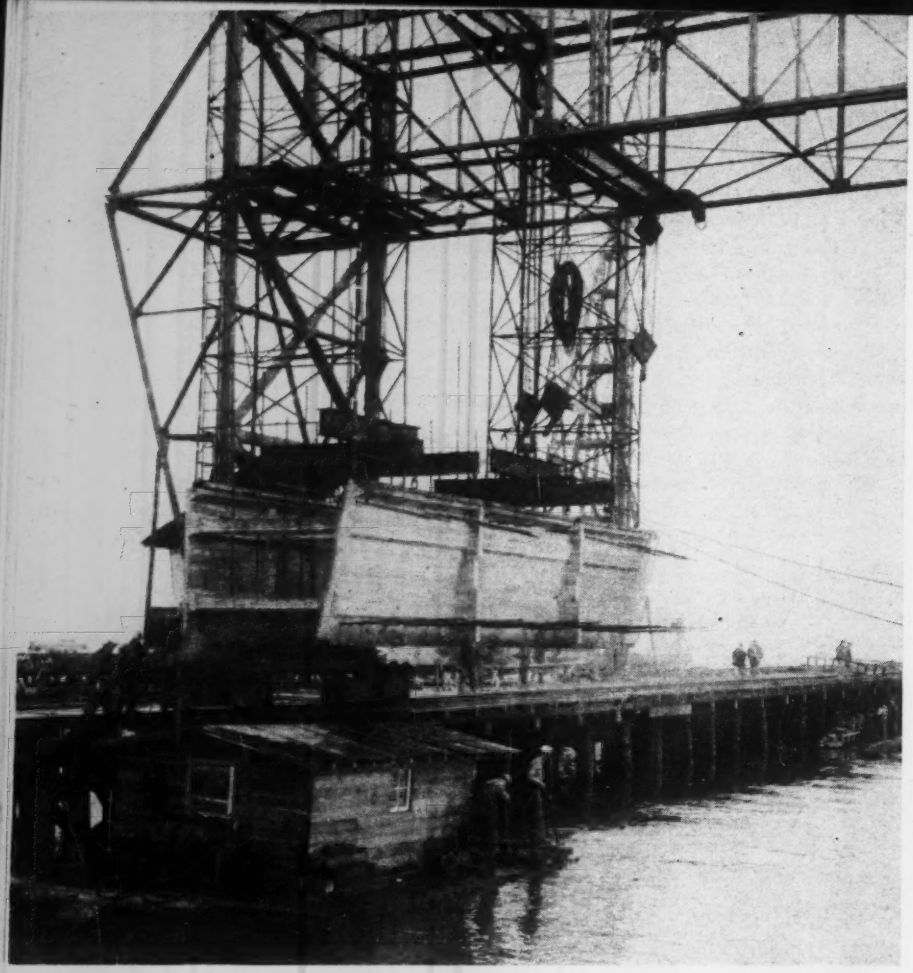


Fig. 1. One of the three gantrys spanning the drydock construction was used to transport and set precast concrete forms.

Precast Forms Used For Underwater Concrete

***Contents in Brief**—Unusual saving of critically short steel shapes was accomplished on construction of three concrete graving docks at San Francisco by precasting forms from concrete and setting them deep under water to confine tremie placed concrete for the walls and floor. Gantries spanning the work were an important construction tool — carrying a circular saw for uniform underwater cutting of foundation piles, handling the precast forms and supporting tremie pipes. The tremie placing was handled in a manner that assured subaqueous concrete equal in quality to that poured in the dry, despite exceptionally high submerged lifts.*

THREE IMPORTANT but relatively small concrete graving docks built by the Navy's Bureau of Yards and Docks at Hunter's Point, San Francisco Bay, had to be put in a location where the bottom was soft bay mud. With a foundation of this sort special importance attached to the quality of concrete. Accordingly, in addition to providing thick walls, specifications required that the concrete have strength, bond and shear values equal to that normally required for concrete placed in the dry. This despite the fact that the construction program called for placing practically all of the concrete by the tremie method. The mud bottom precluded the use of an enclosure to permit construction of the docks in the dry.

To meet this set of conditions a plan of operation was worked out in which all tremie concrete went directly into or between precast concrete forms, thus affording opportunity to get fresh concrete into place with minimum risk to the carefully proportioned mix. Despite some phases of the procedure being without precedent, the work was completed successfully and the quality of the tremie concrete is reported as being up to requirements in all respects.

Essentially, the project divided itself into three parts: (1) the preparation of an adequate foundation, (2) the onshore work of casting and installing the reinforcing steel in the concrete forms and then lowering them with gantries into place on the foundation. Finally, (3) delivery of concrete into these forms in such a way as to avoid damage to or deterioration of the mix while being placed by the tremie method and to avoid subsequent leakage through the concrete.

The three graving docks are constructed side by side. The one in the center has a net inside width of 75 ft., the two flanking docks are 60 ft. wide in the clear, and each of the three is 420 ft. long. The docks are separated and flanked on the sides by wharves 40 ft. wide supported on wood piling. The wharf piles (at least all portions above the mud line) are creosoted; piles used under the docks themselves, being constantly below the mud line, are untreated. Some 5,000 piles were used in the foundations of the drydocks proper and another 1,000 are in the flanking wharves. The lengths range from 30 to 140 ft.; splicing was usually necessary for the lengths greater than 70 ft. When splices were used they were made with 4-ft. lengths of 9 in. dia. steel tube, into which the pile ends were forced.

Preparing the foundations

In the tide flats where these docks had to be built the deep mud bottom, without special treatment, would have been entirely inadequate for loads such as would be imposed by drydocks. Accordingly, about half a

million yards of the mud was removed from the site by hydraulic dredge and pontoon pipeline. In the area thus cleared of mud 140,000 cu.yd. of sand was pumped in as a blanket, about 10 ft. thick. This was laid down in the dredged area as a base on which the dock construction could be carried on without bringing concrete into contact with mud. The surface of the sand was carefully leveled off with a suction dredge moving slowly back and forth. To bring the sand surface still more accurately to grade it was then gone over with a gantry-supported steel trowel to be described later.

At the dock site the present shore line is farther out than it was formerly, thus leaving a "mud flat area" between the artificial sand blanket and solid ground ashore. An earth fill had to be made across this mud to provide access to the docks and there was danger of forcing this mud under the docks by the loading thus imposed. To avoid this contingency, before placing the approach fill, a wide trench was dredged to firm bottom along the inshore edge of the sand blanket. This trench was filled with harsh sand. When the approach fill was made, material in the trench served as a dike that prevented soft mud under the fill from squeezing out into the dock area.

Saw rig for under water cutting

Wood piles for the foundations, at 5 ft. centers both ways, were driven through the sand blanket, on through the soft mud and down into the firm material beneath. Piles were cut off with the tops projecting 1 ft. above the accurately leveled surface of the sand blanket. For cutting the piles a circular saw 5 ft. in dia. was used, driven by a vertical shaft from a motor above water level. The saw assembly was mounted on a car arranged to move along the lower deck of a gantry spanning the dock, built expressly for this purpose. Thus two motions were provided for the saw; it moved on the gantry transversely across the dock, cutting each successive pile as it was encountered, then the gantry advanced a distance equal to that between the rows of piles and the saw returned across the dock. No divers were sent down while the saw was in operation.

The saw operated at a fixed depth below the motor platform at the end of a shaft about 40 ft. in length. Although the shaft was 8 in. dia. to obtain additional rigidity it was supported in bearings carried in a cantilever truss. To make sure of effective operation a large motor was required; a 100-hp. motor was available when this equipment was assembled and this was used. As the stubs of piles cut off were released they naturally tended to shoot upward through the water with considerable velocity, endangering the motor mounting immediately above them. As protection against this menace a steel fender, installed just below the motor platform, deflected the uprushing portions of the piles as they reached the water surface.

It was this pile cutting rig, designed and built to meet circular saw requirements, that was also very handy in the accurate leveling of the sand surface. The motor mounting had been hinged in its connection to the gantry so that it could swing through 90 deg., thus bringing the shaft up parallel to the gantry deck and making the lower end of the shaft readily accessible for changing or servicing saw blades. For the sand leveling operation, instead of the saw, a steel plate was attached to the shaft, arranged to operate something like a snowplow, 1 ft. below the pile cutoff level. This blade, or "trowel," was moved across the surface of the sand prior to piledriving with such good effect that inspection by a diver found the surface everywhere within 0.1 ft. of prescribed grade.

Gantry for each operation

In the piledriving operation the wharves were built first, working out from shore to the dock sites and completing the wharves by sliding the drivers out along the stringers. Piles under the docks were driven from floating driver rigs using subaqueous hammers. As soon as the wharves were ready to support ties and T-rails, gantries were brought out to span the docks to aid construction operations.

On each dock there were used, in succession, gantries for (1) the circular saw rig, (2) placing precast forms, (3) placing concrete by the tremie method and (4) distributing concrete to the 18-in. finish floor slab in the unwatered dock. Each

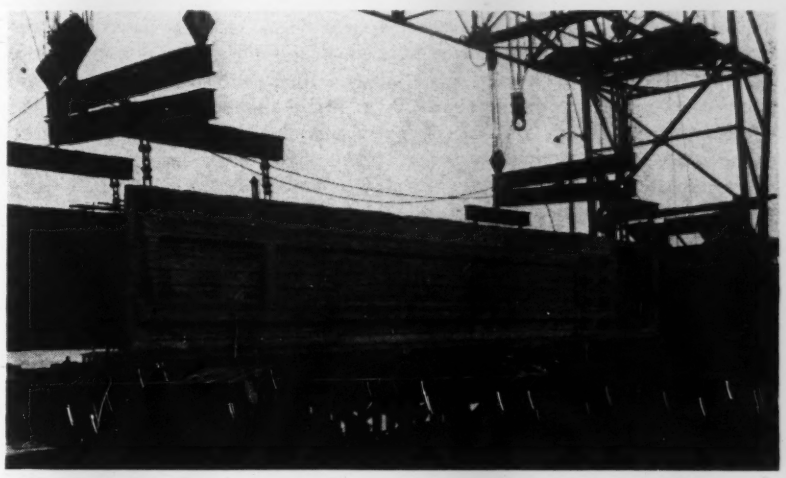


Fig. 2. The lifting rig with equalizer beams made use of an eight-point pickup with a two-point lift. Concrete pressure measuring devices are attached at right end of form and leads carried up to surface.

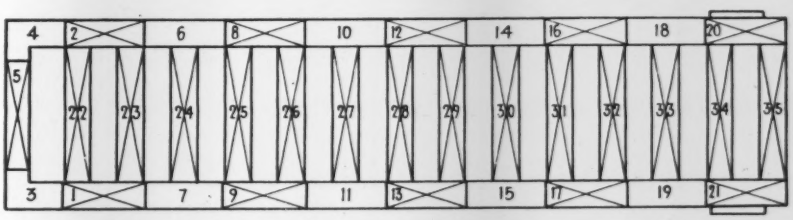


Fig. 3. Sequence followed in placing precast forms for underwater concrete.

dock had one gantry track on which all these gantries operated successively. The gantry spans were 94 ft. over the 60-ft. docks and 109 ft. over the 75-ft. dock. This difference in span length made it necessary to lengthen those gantries that were transferred from the narrower to the wider dock, which was done by inserting an additional panel in the midsection. Simultaneous work of the same sort in two docks made it necessary to duplicate some of the gantries, but as far as possible construction operations were arranged so that a gantry could be routed from one dock to the next in a progressive sequence.

Precast concrete forms

The plan of construction was to deliver all tremie concrete into or between forms previously built on shore and lowered to place on the bottom. For the most part these were precast concrete boxes with open bottoms and reinforced concrete side walls 3 in. thick. For the floor of the 60-ft. wide docks the boxes or shells were 14 ft. wide, 10 ft. high and 60 ft. long, placed parallel, transversely to the center line and 14 ft. apart. This spacing made it possible to fill the boxes with tremie concrete and subsequently to pour the intervening spaces of equal width in the same manner. The shells were made with keyways to prevent any risk of separation along vertical planes.

The precast forms were designed to avoid, as far as possible, any vertical joints or angular projections. Particular attention on this score was given to the joint between center and perimeter forms in the base. How a vertical joint was avoided here is shown in Fig. 1, where the inner sidewall of the precast form is inclined. With this arrangement risk of movement along this joint is obviated by the wedging action that would result from base uplift. Moreover, drill cores taken along such a joint made by tremie methods in a test block, showed excellent bond even in a core drilled from the joint in such a way that one side of the core was from precast concrete of the form and the other side concrete placed by tremie. In Fig. 2 note that the struts and beams, made by thickening certain parts of the walls, have edges beveled at easy angles instead of the ordinary square corners.

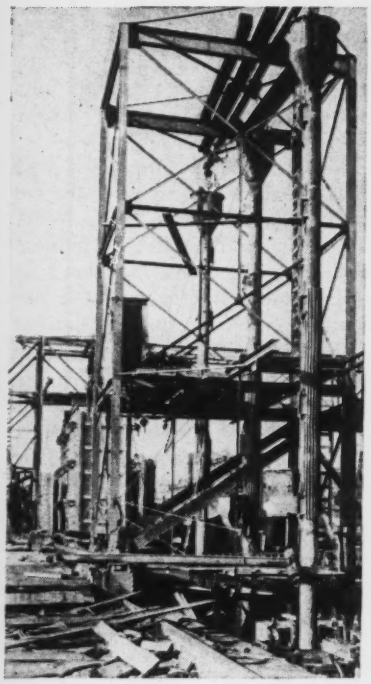


Fig. 4. Three tremie pipes were used in the side walls in which the continuous pour was 39 ft. high. Ports are 5 ft. apart vertically.

Precast forms making up the perimeter of the base were put in place first. Then precast forms for the floor of the dock, all transverse to the center line, were so located that there would be an open space 14 ft. wide between successive forms. The center forms had open ends because the perimeter forms against which they abutted provided closure. The sequence used in placement of the forms was to first complete the perimeter, placing the units in the order shown by numerals in Fig. 3 and then to place the center forms, leaving open spaces between as noted.

Center section cast first

In the pouring operation, precast forms in the center section were filled first; then the spaces between them. Finally, the base perimeter forms were filled as part of the pouring operation, which included side walls to their full height. Forms for the side walls were made up on shore and lowered to place on perimeter forms, making a total height of 39 ft. (the 29 ft. of the side walls plus the 10-ft. depth of the base forms) to be completed as one continuous pour. As the wall were 9 ft. wide it was decided that a length of 45 ft. would make the form units about the right volume for a pour.

In a shell of this size it was found best to use precast concrete slabs for end walls and to assemble them in the casting yards with sides consisting of wood panels. Each of these panels was 29 ft. high and 45 ft. long. The reinforcing specified for the dock walls, consisting chiefly of a network of steel near each face, was completely assembled in the forms before they were put into the docks.

For a continuity between concrete in the bottom and that in the side walls, a double layer of 1¼-in. steel bars embedded in the bottom was left projecting upward into the side wall space. The projection varied, ranging up to 13 ft., depending on stress requirements.

Deformation of shell curtailed

In Fig. 5, showing a section of the side wall forms, it will be noted that diagonal steel and ties were used to prevent distortion of the shell in handling. A notable detail, shown in enlarged section in the drawing, is the combination of a 1⅝-in. tierod with a steel angle. If this assembly had been put in the form without grout it was believed that it might have left a path between tierod and apex of the angle for leakage through the wall and into the completed dock. The remedy was to carefully grout these assemblies, as shown, before the form was put into the water.

To further guard against leakage around the transverse rods, a beveled wood block was placed on the form at the dock end of each rod. After the forms were stripped each of these blocks was split out, the tierod burned off and the resulting beveled recess in the concrete was filled with very dry concrete, tamped in place and held by the keying action of the beveled sides.

This design of the side forms contemplated leaving the outside wooden panels permanently in place. The wood panel on the inner or drydock side of each wall form was removed for reuse after the concrete had hardened. This was done by burning off the ends of the ties with a torch operated by a diver, after which only a little manipulation of the wood panel, aided by the buoyant force acting on the submerged wood, invariably broke it loose and brought it quickly to the surface. A total

of about 2,000 cu. yd. of concrete was used in the precast forms for the three docks.

The casting yard where the precast forms were manufactured was just inshore from each dock. The gantry crane handling the forms travelled over the work area to pick up the units and deliver them, in one operation, to exact location under water. The gantries built for this operation were designed with an adequate margin above the 60-ton weight of the heaviest form. The pickup was done by equalizer beams that distributed the load from only two lifting points to eight points on the upper edge of the precast forms from which U-shaped bars projected from the concrete. This prevented indeterminate stresses as the result of slightly varying rates of lift.

Concrete placement

With all of the precast forms in place a diver carefully checked their alignment and made sure there was a tight joint between forms and a tight fit of the form bottom on the sand blanket. Then pouring began through tremie pipes supported on a gantry. For the bottoms of these tremie pipes wooden plugs were made with a rubber gasket, which could be put on the pipes before they were lowered in such a way as to tightly seal them against leakage and yet so that the plug would remain in place until the pipe was lifted. With this arrangement, once the pipe was filled, it was never necessary to drop the concrete and risk segregation due to loss of seal and resultant mixing of immersed concrete.

With the tremie pipe full up to the intake level and the sealed end on the bottom, the pipe was raised slightly, breaking the seal with the plug and allowing concrete to flow out the lower end. Concrete was allowed to build up around the end of the pipe to a depth of about 2 ft. This developed a back pressure in the pipe that would balance a 12-ft. depth of concrete inside the pipe. By proceeding carefully under this program and with the protection on all sides afforded by the preassembled forms, there was a minimum of contact between water and the moving concrete.

In order to check assumptions about pressure made when the forms were designed for concrete to be placed in this manner, pressure cells were embedded in the form walls at a number of points (see Fig. 2) and readings were made as pouring progressed. Though results of studies are not complete as this is being written, it is believed that interpretation of these readings will show pressures not exceeding corresponding pressures from concrete poured in the dry, corrected for the ratio of the weight of concrete in water to weight in air. The rate of tremie pouring on this job increased the depth of concrete in forms about 2 ft. per hour. At this rate initial set seemed to compensate for additional load by the time the pressure had reached about 300 lb. sq. ft.

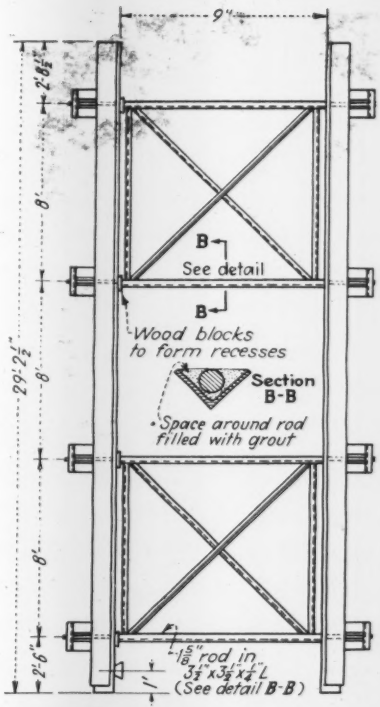


Fig. 5. Section through a side wall form assembly made with wood panels and interior steel bracing. The bracing, and some reinforcing bars, are embedded in the pour.

Hopper fixed to tremie

For placing concrete in the bottom forms, where only a 10-ft. depth was involved, a hopper permanently attached to the top of each tremie pipe was used. For the sides, however, a battery of three tremie pipes was set up, each long enough to reach the full 39-ft. depth of the side wall plus perimeter base forms. These pipes, Fig. 4, were provided with rectangular openings on a vertical spacing of 5 ft. Pouring started with the pipe extended its full length to reach the bottom of the form and the chute from the concrete hopper delivering into the topmost opening. As the form began to fill and the pipe was slowly raised, the delivery chute was successively transferred from one opening to the one next below. Before each transfer the plate that had been bolted over the unused opening was removed.

After the drydocks were unwatered and laitance on the bottom had been cleaned off, an 18-in. concrete pavement was laid over the entire floor

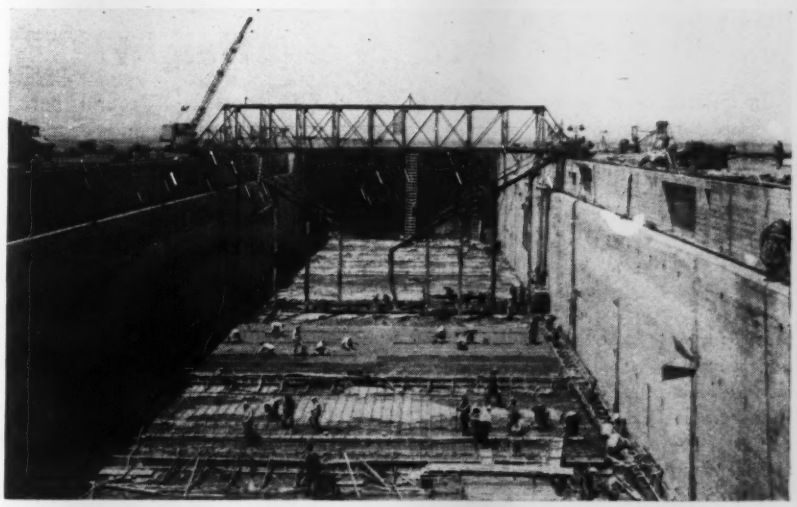


Fig. 6. Gantry used to rigidly support a circular saw travelling in a horizontal plane to cut off bearing piles under water was revised for pouring the finish floor slab in nearly completed drydock.

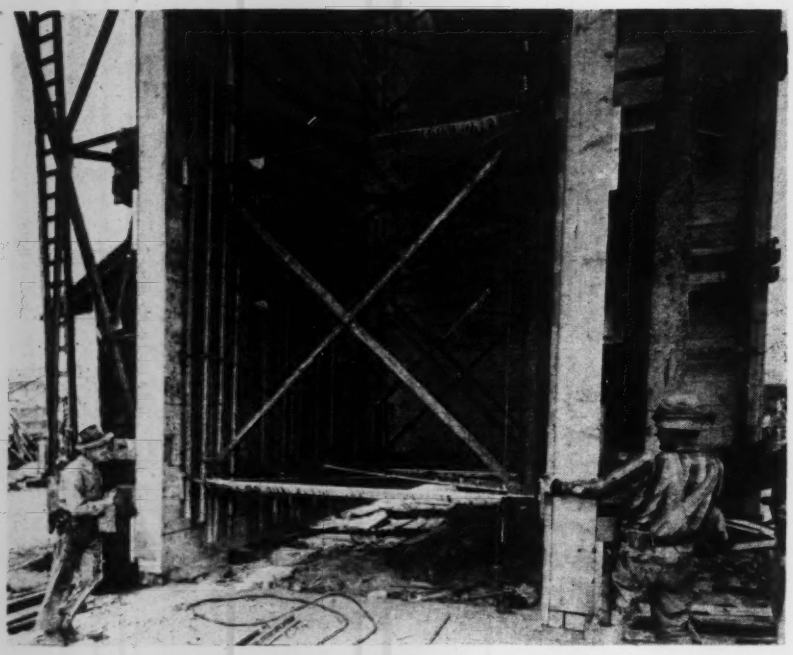


Fig. 8. The side wall form assemblies were made with removable wood panels. This is the L-shaped unit designated 3 in Fig. 4.

area. This slab provided an accurately leveled surface that was finished to a tolerance of ⅛ in. In it were cast sewer lines, surface drainage slots and keel or bilge block bearers. For convenience in placing this pavement the saw gantry was refitted. On each side a concrete hopper was attached, delivering to a chute extending out over the dock floor toward the dock center line. The gantry was moved as required and gates at intervals along the bottoms of the chutes, under which elephant trunks could be hung, made it easy to deliver to all parts of the floor area. Thus this gantry, always referred to as "the saw gantry," really performed three functions. It was used for accurate leveling of the sand blanket, sawing off the piles and finally for pouring the floor finish slab in the dry.

Instead of a floating caisson gate of the type ordinarily used on drydocks, each of these docks was fitted with a steel gate hinged along a horizontal line just below the sill at the dock entrance. By means of pipe connections the hollow gate can be filled either with water or with air. When filled with water the gate swings about the hinge to sink to a position slightly below a horizontal plane through the floor of the dock. Here it rests on a pile bent until the water is forced out by compressed air, then the gate swings up again to its vertical position where it is held against a watertight seal. These gates effect a considerable time saving as complete opening or closing operations require only about 15 minutes.

Construction work on the U. S. Navy Drydocks, Hunter's Point, was under the general direction of Capt. F. C. Bedell, CEC, officer in charge of construction, and Capt. George F. Nicholson, CEC, resident officer in charge for the Bureau of Yards & Docks at the Hunter's Point project. Lieut.-Comdr. W. L. Dickey, CEC, was project engineer on the drydocks, for which the general contract was held by Ben C. Gerwick, Inc. John C. Lewis was superintendent for the contractor.

Tests of Lapped Reinforcing Bars Indicate Effect of Lug Height

In tests to determine the behavior of lapped reinforcing-bar splices, in which were used two types of bars, one having a relatively greater lug height than the other, it was found that the bar that had a considerably greater bearing area of the lug per inch length of bar not only picked up stress at its free end in the splice more rapidly but developed greater maximum bond strength than the other type. These tests were reported in a paper, "Lapped Bar Splices in Concrete Beams," by Ralph W. Kluge and Edward C. Tuma, in the *Journal of Research* of the National Bureau of Standards, vol. 3, No. 35, September, 1945.

According to the authors, who tested ½-in. and 1-in. round bars, those lapped 30-bar diameters or more developed at the limit of the splice the yield strength of the steel, a value that in some instances was as much as 60,000 psi. Little difference was observed in the behavior of splices containing bars spaced 1½-bar diameters clear or with the lapped bars in contact. However, it is pointed out that as far as bond resistance is concerned, the bars used in these tests had a type of lug pattern probably superior to that of many commercial bars.

It was also found that bond stress was greatest near the free end of the lapped bar. The maximum values occurred at about the same tensile stress at the loaded end of the bar, regardless of the length of lap. A possible exception to this was the 20-bar diameter splice.

With two exceptions, the magnitude and distribution of the slip along the lapped bars were similar for a given type and size of bar regardless of the length of lap. A 1-in. diameter bar of the type with smaller lugs exhibited a considerably greater slip for a given bond stress than any of the other bars.

The differences between the two types of bar of the ½-in. size were minor. Both showed slightly less end slip, for a given bond stress at the free end of the bar, than the 1-in. bar with the greater lug. Insofar as bond and tensile stresses are concerned, the general behavior of the ½-in. bars was similar to that of the 1-in. bars.

Huge Underground Vaults Built Oiltight

Contents in Brief—*Underground vaults built for storage of Navy diesel and fuel oils are concrete-lined vertical cylinders 100 ft. in dia. and 250 ft. high overall, with dome-shaped ends at top and bottom. Excavation in solid rock involved ingenious alternations of shaft sinking, upraising and enlarging operations. Care was taken to make sure that the steel-faced, concrete walls of the cylinders were of uniform thickness; prestress in the concrete was applied by pressure grouting between lining and rock. This article, written by News-Record's Pacific Coast Editor, Nathan A. Bowers, following a visit to the job early in 1944, has only recently been released by the censors.*

CONSTRUCTION of underground oil storage vaults at Pearl Harbor in the Hawaiian Islands by the Bureau of Yards & Docks, U. S. Navy, involved numerous features for which no precedent was found in design or construction methods. The vaults are cylindrical in shape, 100 ft. in dia., sunk deep in solid rock with top and bottom ends of the cylinders dome-shaped for strength. The over-all height of each vault is about 250 ft. The excavation for each vault is lined with concrete which is faced on the inside with steel.

The program for placing the concrete lining was such as to give it as much prestress as possible by pressure exerted on the outer surface of the concrete by grout forced into the space between the lining and the rock behind it. The delivery of stored fuel to and from the vaults is through a tunnel that passes underneath them, thus avoiding need for any superstructure above ground. (See drawing on p. 63.)

The vaults, of which a total of 20 was built, are arranged in two parallel rows well below ground surface and with a minimum rock spacing between adjacent vaults of some 200 ft. each way. The parallel arrangement of the vaults permitted a convenient location of two access tunnels in the center between them, with branches to each vault. The tunnel below the vaults was used for handling most of the excavated material, and in it are the oil delivery pipelines. The upper access tunnel was used for excavation and concreting of the upper domes and for ventilation.

In order to avoid the necessity for working on a structure immediately above a considerable depth of excavation, the dome at the top of each cylinder was constructed first in an excavation just large enough to accommodate the dome-building operations. A ring tunnel was first driven around the spring line of the dome, timbered where necessary, and a concrete curb ring was put in at this level with a channel-iron bedded in its top. The circular tunnel served as a start for the upraise toward the crown: muck was passed down to cars in the tunnel. Drill holes in the rocks were put in radially. Because of the solid rock formation it was possible to excavate over the entire dome area and, using the channel-iron in the curb as a foundation, to erect centering for the dome concrete, consisting of 8-in. I-beams in seven-segment arches.

Twenty-four of these I-beam arches were started at the springline and carried up radially toward the crown. When this framework was completed it was covered over with steel plates, ¼ in. thick, welded together, which

Crayon Drawing by Lili Rethi

Artist's "cutaway" drawing of four of the twenty fuel storage tanks under Red Hill in Hawaii gives some idea of their huge size, 100 ft. in diameter by 250 ft. high. In order to show the underground disposition of the tanks, the artist had to show them as in a huge excavated cavern, but it should be noted that only the volume occupied by the tanks and the connecting tunnels actually was excavated. The drawing is one of twenty-five relating to various war construction jobs of Pacific Naval Air Base Contractors made by Artist Lili Rethi for a book by David Woodbury, to be published soon by E. P. Dutton & Co., New York.

were to remain as a permanent part of the lining. From the upper surfaces of the plates anchor hooks projected upward as a fastening into the concrete which was to be poured over them. The steel plates served as a form and became the permanent lining of the dome.

Thickness of the concrete in the dome was made 8 ft. at the base and 4 ft. at the crown. Two curtains of reinforcing bars 1 in. in dia. were used and the minimum spacing of the reinforcing steel was 9 in. At the top of the dome an opening 6 ft. in dia. provided for a shaft, extending during construction to the surface above. A portion of this shaft was later used in the ventilation system.

After the concrete in the dome had set, the steel framework was removed, leaving the plates as a facing on the inside of the dome. This construction made a dome that is not truly spherical, but of orangepeel shape with 24 surfaces curved in one direction only. For the entire group of vaults simultaneously under construction, only eight sets of the steel dome frames were needed; they were used over and over again after being moved ahead as successive domes were constructed.

Excavating the cylindrical vaults

After completion of each dome, and removal of the supporting steel framing, the first work on the large excavation to be made beneath was a small pilot shaft sunk on the vault center line from the ground surface all the way down to the level of the pipeline tunnel below the bottom of the vaults. This shaft was timbered and was made 4x6 ft. inside the timbers. Later the size was increased to 12x12 ft., again by working down from the top. From this larger shaft radial holes were drilled for blasting. The radial blasting began at the bottom, to facilitate the disposal of the muck, and increased the diameter to 30 ft., roughly, all the way up. In this operation a timber hopper was first built at the bottom of the shaft to facilitate loading the muck onto cars in the tunnel below. Enough muck was left on the hopper timbers to protect them from damage as the rock fell.

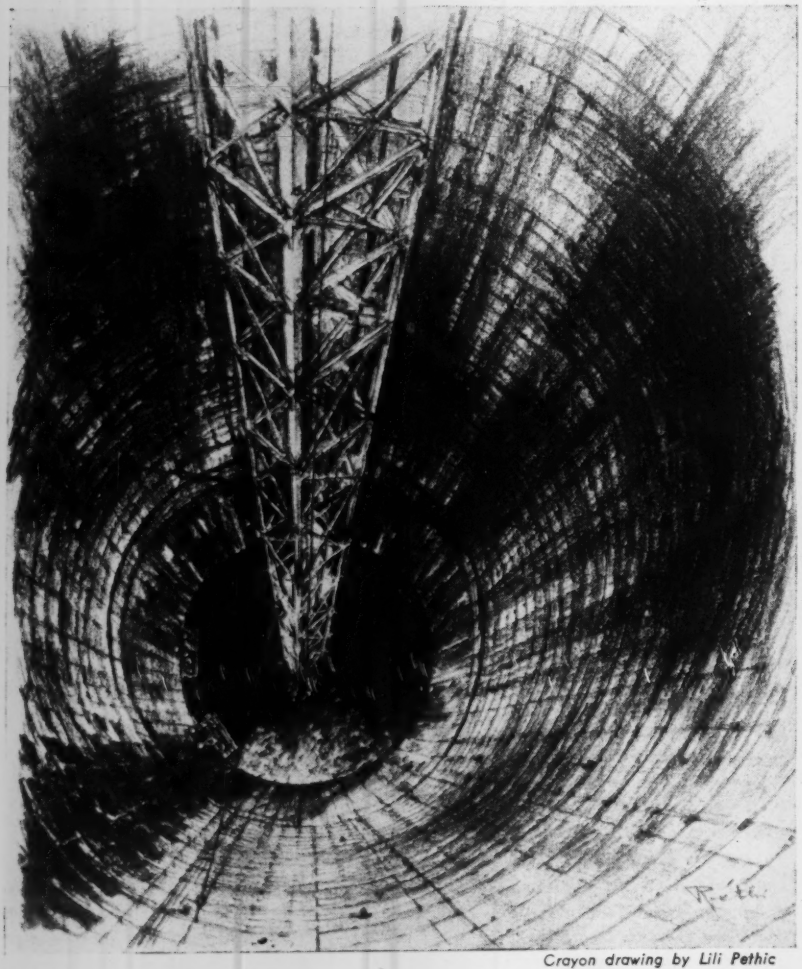
After the 30-ft. shaft was completed all the way up, work began at the top on enlarging to the final diameter of 100 ft. (net). This plan of construction made it possible to get a smooth wall because the job was worked downward in the final stage, thus giving a bench for convenience of the crew in making accurate placement of charges and scaling out loose material. The central hole, of course, gave the advantage of gravity disposal of muck.

In this operation the concrete dome, by this time well set and with full concrete strength established, had to be undercut all around about 3 ft. This undercutting left a bearing of only 5 ft. of the original 8 ft. of dome arch thickness. There was some difference of opinion among engineers as to the safety of this plan, but the arguments in favor of undercutting prevailed and proved to be sound. The final concreting of the cylinder walls was made in all cases without any noticeable settlement of the domes.

Side wall construction

The thickness of concrete in the side walls was to be a minimum of 2½ ft. at the top and 4 ft. at the bottom. Overbreak increased this thickness somewhat but where overbreak was more than 18 in., specifications required that the excess space be filled with shotcrete. In two of the vaults overbreak was great enough to make it advisable to form up the space and fill in with poured concrete rather than with shotcrete. However, after this had set, the forms were removed and shotcrete facing was placed to make the backing uniform.

Except for the small shaft sunk originally from the surface, all excavated material went out through the tunnel that passes beneath the vaults. This tunnel, which is lined with concrete, is in a rock formation which has alternating layers of cinders and conglomerate varying from 10 to 20 ft.



Crayon drawing by Lili Pethic

Completed vault as seen from above discloses testing water in lower dome, which is 100 ft. in diameter at the springline. Permanent steel tower is shown in center, and the steel lining plates are 5 x 20 ft.

in thickness. In addition to its convenience for disposal of the muck it provides a safe underground location for the pipes through which the fluids stored in the vaults are pumped in and later delivered as required.

Protection for equipment and personnel in the subterranean pumping plant and for lower levels of operation generally, is provided by a series of reinforced concrete bulkheads with steel doors, which would close automatically and keep the oil from flowing out in case of a break in pipes or vaults.

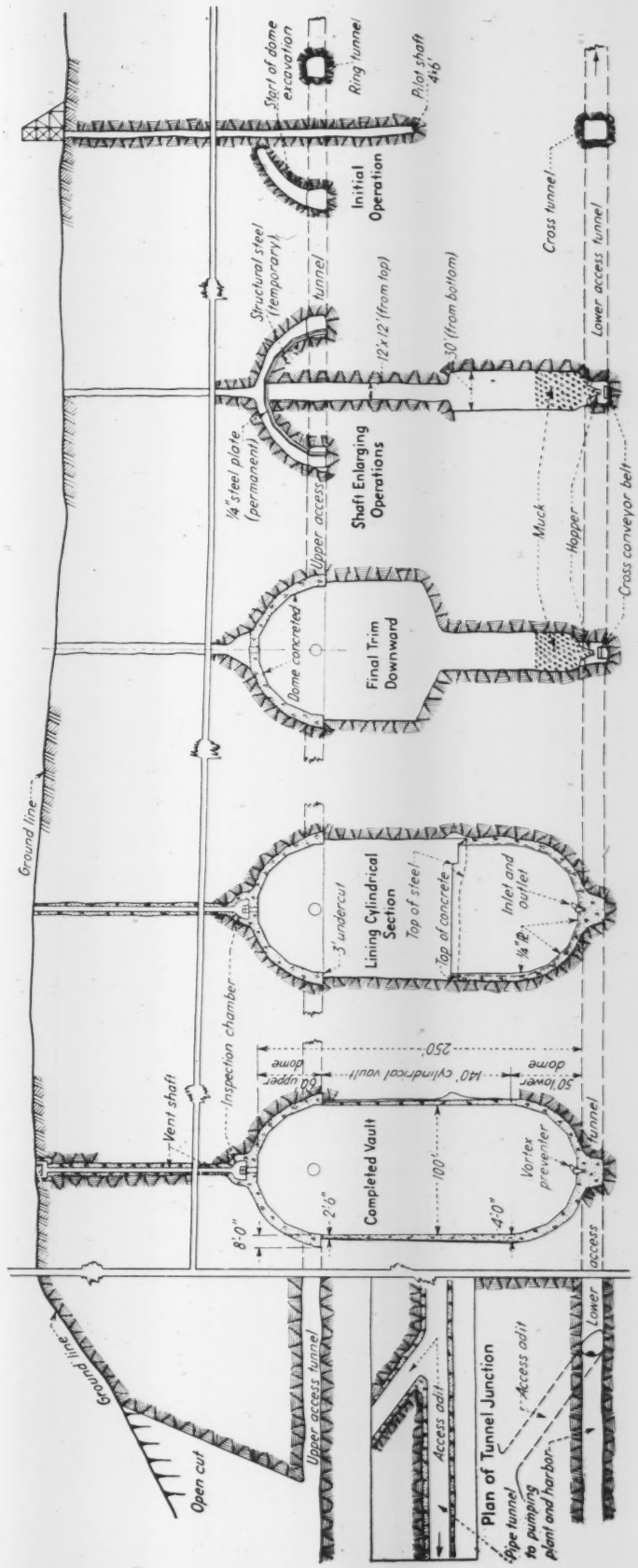
All vaults were sealed, vaportight, but two points of access were provided in each. One, at the spring line of the upper dome, is a steel bulkhead 8 ft. in dia.; the other, at the crown of the upper dome, is the 6-ft. shaft opening that served first for ventilation, later for delivery of concrete and, finally, closed with a removable steel cover, as an inspection opening.

Placing steel lining

After completing excavation for the vaults and filling in the overbreak, a steel tower was built in the center of each one, extending from the bottom of the lower dome to the crown of the top dome. This was primarily to facilitate placing steel lining and pouring concrete behind it. However, the tower was left in place as a permanent fixture that might be useful in operation and maintenance.

This tower, which is about 8-ft. square, was set up in 10-ft. panels made of 6-in. steel angles. During construction it was provided with booms slung by wire rope from cranes at the top. The cranes served both in placing the steel plate lining in the cylinder and in supporting the swinging radial chutes that were used for pouring concrete back of the steel plates.

Necessary ventilation, made the more important by the heat of welding when the lining was being fastened together and later by the heat of setting concrete, was provided by two units. One of these was an airplane propeller driven by a 100-hp. motor that sucked air in through the lower tunnel and forced it into each cylinder at the bottom; the other was a blower that forced air down through the 6-ft. shaft extending up to the surface. Both of these air inflows into the vault were vented at the springline of the upper dome, escaping through



Step-by-step procedure in excavating and lining the oil storage vaults, from the small vertical shaft and ring tunnel of the initial operation, shown in the sketch farthest to the right, to the huge lined vault in the sketch at the left. Except for the upper dome muck which was taken out the upper access tunnel, all excavated material was dropped down to the lower access tunnel and removed by belt conveyor.

an access tunnel system at that level.

The steel lining consisted of plates 5x20 ft. in size, ¼ in. thick. Each plate had 3x3-in. angles along one of the 20-ft. sides, and a nut was welded on at each point where a lug or clip was to be bolted to the angle of the preceding plate. Thus as each additional plate was brought down it was first bolted in place, then spot welded to hold it in the true arch position. At varying intervals around the periphery wales were raised up the inner face of the walls as the work progressed to hold each successive plate in a truly vertical position during welding operations. The plates were separated ¼ in. between adjoining edges to leave space for welding.

The ¼-in. plates were delivered flat but the angles, before being attached, were precurved to the prescribed radius. In preparation for each plate the angle was first bolted and then welded to the plate below to make a true circle and a properly curved landing place for the next ring of liners.

Concrete placing

Aggregate for the concrete used in lining was made from the excavated rock by passing it through a crushing and screening plant. An 8-in. jaw crusher in the tunnel below the vaults received muck from the excavation and discharged it onto a conveyor belt that delivered to a crushing and screening plant outside the tunnel. Everything less than 4-in. size was screened out at the end of the belt and dumped in waste storage. This was about half the total belt delivery. The plus 4 in. rock went to rotary crushers and screens from which five sizes were segregated, namely, No. 4 passing through a ¼-in. screen, No. 3, ¼- to 1-in. screens, No. 2, 1- to 2-in. screens, No. 1, 2- to 3-in. screens. From the No. 4 product the rock used in the shotcrete was obtained by rescreening and using the material that was less than $\frac{3}{16}$-in. diameter.

Concrete dropped 150 ft.

Mixing was done at the surface and the concrete was dropped into the vaults through 8- and 10-in. steel pipes that passed down through the ventilating shafts. The drops were made in successive stages to avoid segregation, each drop terminating in a steel remixing box with a bottom reinforced by a grill of structural I-beams to absorb wear. The maximum drop in any one stage was about 150 ft.

Delivery of concrete into place behind the steel lining was made simultaneously with placement of lining, which usually was kept about two lifts above the concrete. Crews handling steel and concrete were worked on opposite sides of the vault as much as possible to avoid interference. Concrete was placed in 5-ft. lifts and was delivered through swinging radial chutes that placed two of the 5-ft. lifts between successive raises of 10 ft. each.

Special attention was given to making the thickness of the concrete wall, at any particular level, as nearly uniform as possible throughout its circumference in order to avoid any inequality of stresses that might later be set up. One curtain of reinforcing was put in the walls near the inner face with 1-in. bars spaced on 12-in. centers both ways and located 4 in. from the inner face.

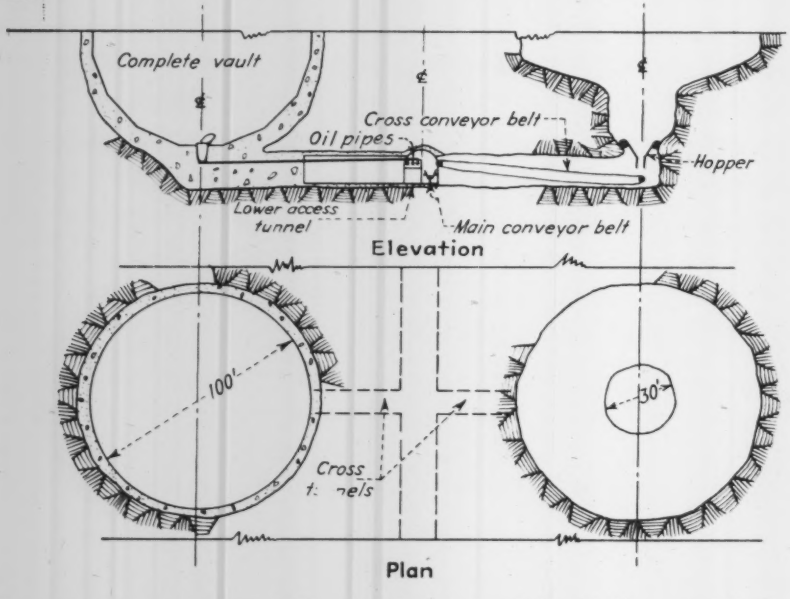
Near the top of the cylinders the single reinforcing curtain was supplemented by a second curtain extending some distance into the dome as a means of strengthening the joint between dome and cylinder. The only expansion joint in the entire concrete and steel lining was put in at this connection between the top dome and the cylindrical barrel. It consisted of a single horizontal fold in the steel plate around the circumference of the cylinder, which permitted separation of the cold joint between top of cylinder and bottom of upper dome without the loss of the oil tightness. A total of 21,000,000 lb. of steel reinforcing was used.

Grout used for prestressing

After the overbreak had been filled in with shotcrete and before the steel lining was placed, the side walls were painted with a coating intended to prevent bond between concrete lining and the shotcrete or exposed rock wall. Before deciding upon what to use in this coating experiments were made in the laboratory with various materials that could be sprayed on. Some of those tested were the Hunt curing compound, asphaltic paints of different sorts and a slurry made of mud and water. The most effective (according to laboratory tests) was a "soup" made up from local mud and water mixed in proportions that would spray well.

This means of preventing bond was effective, as shown by a dial gage on rods extending through lining and shotcrete to points embedded in the rock well back of the excavation. This gage indicated that the joint between the concrete and the rock opened up in some places as much as ½ in. as a maximum.

This ½-in. maximum was made up of the combined effect of (1) the shrinkage in the concrete cylinder



For excavation, conveyors in the cross tunnels carried muck to a conveyor in the lower tunnel. Pipes for filling the vaults occupy the tunnel permanently.

shell due to cooling and (2) movement caused by the pressure of grout forced into the annular space between the cylinder walls and the surrounding rock surface. Grouting was done after a sufficient time to permit most of the heat of hydration to dissipate. This was necessary to secure a lasting benefit from the grouting.

Rock resists pressure

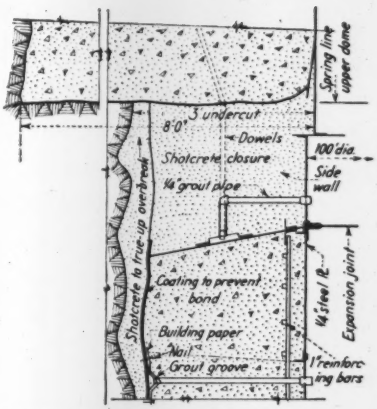
Prestressing the concrete lining was important because of the practical and economical limitations of providing sufficient reinforcement in the walls to take the hydrostatic pressure of the stored oil. Therefore, the vaults were designed in such a way that most of the liquid pressure in the tank is resisted passively by the surrounding natural material rather than by the reinforcement in the walls. Grouting of the annular spaces between the walls of the vault and the material around it was intended to fill any voids and to compress any weak areas in the rock envelope to a required bearing strength and, at the same time, to put the inner concrete shell under compression prestress.

In this way the filling of the vault introduced no new stresses in the concrete lining or the surrounding rock; instead the effect was merely reduction of prestress in the lining. A very considerable saving in the amount of hoop reinforcement was thus effected. The reinforcement was relied upon for general tying up of the structure, redistribution of reaction pressures, and to take care of special stress concentration.

Grout pressure was applied through 1½-in. pipes left imbedded in the concrete walls for this purpose. Four of these pipes were used per ring. The spacing between outlets in the first lift was 15 ft., in the next ring 20 ft., then 35 ft. and finally 40 ft. The pressure used in the grout gun ranged from a minimum of 40 lb. to a maximum of 120 lb. Grouting was done from the bottom up progressively, allowing time for the grout in each ring to set before pressure was applied in the ring next above. Compression in the concrete lining resultant from the grouting gave a prestress in the concrete somewhat less than was desired.

Few leaks developed

As the concrete was poured, twelve indicator pipes were carried up from the side walls to the ventilating tunnel above the top dome where an indicator board would aid in locating leaks should any occur. These indicators were to locate the leak within one-twelfth the total area. After completion of each vault it was tested with fresh water filled to the 6-ft. dia. neck at the top of the dome. Because of this constriction in diameter a hook gage made it possible to measure any change in water volume quite accurately. Records were made of changes in volume, from whatever cause, in terms of gallons per hour.



Detail of closure between upper dome concrete, the first to be poured, and concrete in the top of cylindrical walls, the last to be placed.

Volume increased under test

The rule was that no vault would be accepted until the measurement at the top of the dome showed an *increase* in volume of 2½ gal. per hour. This increase was brought about by the rise of temperature in the water which increased the volume. The temperature increase resulted from the water being warmed by heat of setting which was still residual in the concrete walls at the time of test.

A few leaks were found and several tanks were drawn down until the telltale system located the area involved and repairs could be made by welding the steel lining. The water level in each vault was observed for 12 hr. to make sure that the leak repair was satisfactory.

Construction was started on only a few vaults, but other vaults were added progressively until work on the entire group was under way simultaneously. Crews could be employed more economically and to better advantage by training them for a certain phase of the work and then moving them from vault to vault for a particular stage of the operation.

Design and construction of these oil storage vaults was a project that originated with the Bureau of Yards & Docks, U. S. Navy, and was carried out by officers of the Civil Engineer Corps. Vice Adm. Ben Moreell was chief of the bureau at the time of construction. The work was done under the immediate direction of Comdr. B. F. Rush, CEC, USNR.

Construction work was performed by the Pacific Naval Air Base Contractors under the sponsorship of the Morrison-Knudsen Co., Chas. P. Dunn, chief engineer, James P. Growdon, chief hydraulic engineer, Aluminum Co. of America, served as consulting engineer.

Uruguayan Irrigation Works Has Multiple Purpose Use

The republic of Uruguay through its public works program adopted last year is initiating an intensive construction period in irrigation. The electrification of various provinces is planned, as well as their economic transformation through increased cultivation as the result of irrigation.

One of the most extensive hydraulic projects is the canal in the region of Arapey, a rich river zone of the republic. The canal will serve for navigation purposes, utilizing the upper reaches of the Uruguay River. It also will supply the necessary water for irrigating 49,400 acres, and for a hydraulic plant which will produce 10,000 kilowatts, furnishing energy for two provinces, Artigas and Salto, of Uruguay. It will extend from the port of Salto to the Aropey, thence to the Uruguay River.

The Aropey canal will be navigable for river boats carrying 200 tons of cargo. The project is considered as having decisive influence on the agricultural development and prosperity of the region, whose climate is adaptable to fruit-growing and gardens, sugar cane, flax and jute.

It also denotes a new stage in the economic evolution of Uruguay through a national policy utilizing hydraulic resources which will be fundamental factors in irrigation and power tending to increase agricultural products and opening new perspectives for the future of the country.

Construction Cableways on Norfork Dam

Harrison V. Pittman,
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Little Rock, Arkansas

***Contents in Brief**—The essential features of design, erection, mechanical operation and control are given for the world's longest construction cableways, used at Norfork Dam for placing 1,500,000 cu. yd. of concrete. A description and a diagnosis of the cause of a major failure of one of the cableways is presented.*

TWO CABLEWAYS, with a common head tower in fixed position and two movable tail towers, were used for the major concrete and material handling at Norfork Dam. The cableways spanned the North Fork River and its entire flood plain, requiring a length between towers of 2,834 ft., the longest on record for construction cableways.

Norfork Dam, 233 ft. high and containing about 1,500,000 cu.yd. of concrete, is in north Arkansas where it forms the first unit of a comprehensive reservoir system for the control of floods and the generation of hydroelectric power in the White River Basin. The project provides for 1,983,000 acre-ft. of storage and will have an ultimate installation of four 35,000-kw. units for power. (*ENR* Feb. 10, 1944 vol. p. 187).

The relation of the cableway to the dam and mixing plant is shown in Fig. 1. The fixed head tower is at the right abutment. The two traveling tail towers are on the left abutment, both designed to travel on the same tracks, which were laid out on a radius of 2,834 ft. from the head tower. The tail towers moved sufficiently to bring the cables over any part of the permanent structure. The cableway system was erected in 1941 and used until completion of the structure in 1944.

The cableway was planned to carry 4 cu.yd. of concrete. The moving load, including load-block and bucket, was in excess of 14 tons. Adding an impact factor of 25 percent gave a maximum concentrated load of 35,250 lb., the principal factor in design of the cableway.

Component parts for the cableway were obtained from various sources. The head tower had an effective height of 148 ft. above El. 590 and the movable tail towers each were 106 ft. high above El. 650 so that the track cables were about 18 ft. higher at the tail towers than at the head tower. Designed sag was 5.5 percent of the 2,834-ft. span.

The criteria for design and the formula used are shown in Tables I and II. With a $2\frac{3}{4}$-in. dia. lock-coil track cable, having an ultimate strength of 840,000 psi. the factor of safety under the maximum design load was 2.6. The pull exerted by the loaded track cable was used to determine the design of the towers.

Operation of the two cableway units was entirely independent. Separate sets of controls and hoists were used to actuate movement of each carriage, utilizing an endless line, and a load line for hoisting, sometimes synchronized with the endless line for travel. Slack carriers, to prevent sagging and fouling of the load line and endless cable, were distributed by a button line, which was held taut by a heavy counterweight.

TABLE I. DESIGN CRITERIA FOR NORFORK DAM CABLEWAYS

Uniform Load	
1 — 2 3/4-in. dia. lock coil cable	18.54 lb./ft.
2 — 7/8-in. dia. cables (haul line)	2.40 lb./ft.
3 — 3/4-in. dia. cables	2.70 lb./ft.
Miscellaneous	1.00 lb./ft.
Total	24.64 lb./ft.
Concentrated Load	
4 — Cu. yd. concrete	16,200 lb.
1 — Carriage (estimated)	6,000 lb.
1 — Load block	2,000 lb.
1 — Bucket	4,000 lb.
Subtotal	28,200 lb.
Plus 25 percent impact	7,050 lb.
Total	35,250 lb.
Span	2,834 ft.
Elevation of connection at tail tower	756 ft.
Elevation of connection at head tower	738 ft.
Sag — 5.5% — .055 × 2,834	156 ft.
Ultimate strength of lock-coil cable	840,000 lb.
Modulus of elasticity of lock-coil cable	19,000,000 psi.
Computed hor. component of cable tension	319,000 lb.
Computed cable tension at tail tower	324,000 lb.
Computed cable tension at head tower	323,000 lb.
Factor of safety = $\frac{840,000}{324,000}$ =	2.6

Single head tower

The head tower for the cableway was located far enough beyond the north end of the dam that the mixing plant could be located outside the structure and under the cableway. It had an overall base dimension 29 x 44 ft. with rear legs vertical and front legs sloped about 1 to 4. Each leg rested on a concrete block, the surface of which was normal to the slope of the leg. The base of the tower was paved with concrete on which separate hoists, electrical controls and other equipment for the two cableways were erected and housed.

The head tower was guyed at six

points while two main backstays were used, one in line with the extreme travel of each of the cableways. Each backstay anchor, however, was designed to carry the stress from both cableways. Under load, the head tower tended to rotate about its front legs, which carried the total vertical component, but the structure had a factor of safety of about two in compression. The tower was erected by a crane to a height of about 100 ft.; above that erection was done by a gin pole, raised to the level of successive cross bracing.

Traveling tail towers

Resisting a horizontal pull of 319,000 lb. more than 100 ft. above the base of the moving tail towers was accomplished by sloping the forward legs of the tower 1:2.3 and loading the vertical back legs with 345 tons of counterweight. The weight used was about 40 percent in excess of that required to balance a 4-cu.yd. bucket of concrete at mid-span.

The tail tower moved on two separate pairs of tracks, the front tracks being set normal to the slope of the tower legs. Concrete slabs, with 8 x 12-in. oak ties at 24-in. centers imbedded in the surface supported 100-lb. rails at standard track gage.

The tail towers and runway are shown in Figs. 1 and 5. Standard railroad wheels, axles and journals were used, except for those immediately under the front legs of the towers, the front set for each tower consisting of 14 pairs of wheels, the back set of 12 pairs. The wheel journals were fastened to 8½-in. by 16¼-in. wide-flange beams, except for the two pairs of wheels immediately under each leg of the tower, which are heavy-duty units having a common bearing. These wheels were installed after trouble was encountered with breakage of standard railroad axles located immediately under the tower legs.

TABLE II — FORMULAS FOR CABLE TENSION

$$t = \frac{S\,(2W + wS)}{8d - 4h}$$

$$y = \frac{W\,(S/2)^2}{8t}$$

$$\tan B_1 = \frac{h/4 + d_2/2 + 2y}{S/4}$$

$$T_1 = \frac{t}{\cos B_1}$$

$$\tan B_2 = \frac{d_2/2 - h/4 + 2y}{S/4}$$

$$T_2 = \frac{t}{\cos B_2}$$

W = 35,250 = Total concentrated load in pounds
w = 24.64 = Weight of cable in pounds per foot
S = 2,834 = Span in feet
h = 17.8 = Difference in elevation of supports in feet
$d = d_1 + d_2 = 156 + \frac{17.8}{2}$ = Total deflection at load point from highest support in feet
t = Hor. component of cable tension in pounds with load at center
T_1 = Cable tension at high tower in pounds
T_2 = Cable tension at lower tower in pounds
y = Deflection at center of one half span
B_1 = Angle cable makes with horizontal at high support
B_2 = Angle cable makes with horizontal at low support

Erection of the tail towers was accomplished with the aid of a guy derrick. Electrical controls and machinery for operation of the tail towers were located on the bottom cross framing of the towers and, after erection, were housed in.

Main cable fastenings

The main or track cables of the two separate cableway systems extended only to within a few feet of either the head or tail towers. Each end of these cables terminated in a "jewel block" or socket designed to transmit the load to a pair of bolts on opposite sides of the cable.

At the head tower, Fig. 4, the bolts through the socket were 3¾-in. dia. with an eye formed at the tower end for pin connection to the steel case of an equalizing sheave, which was common to both track cables. A 3-in. cable was carried around this sheave, and the 2-part line passed over large oak bearing blocks near the top of the tower to points in back of the tower where each end of the cables was "jeweled" into a steel block.

Two eye bolts passed through each of these jewel blocks and were connected to a sheave. From each of these sheaves, a 2-part line of 3-in. cable extended to the anchor blocks. As a safety measure, in case of failure of the main backstay cable, each of the two jewels at the back of the cable was lashed to the equalizing sheave in front of the tower by means of a 1½-in., 16-part line.

The above-described arrangement was a modification of the original plan. Originally, the stress transfer

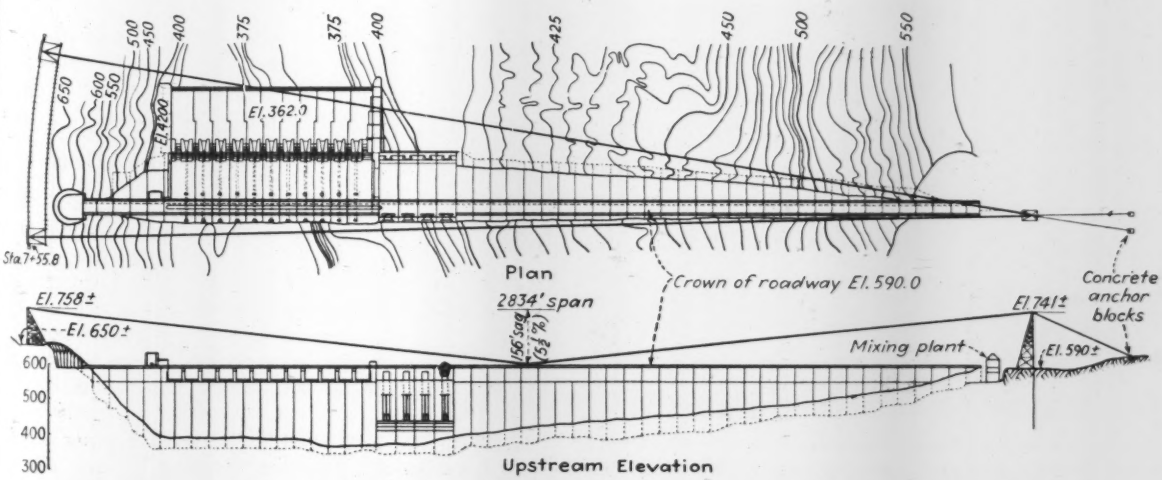

Fig. 1. The two cableways at Norfork Dam had the longest span, 2,834 ft., ever used on a construction project.

from the track cables to the backstays took place through a steel plate, each cable being tied to the plate by means of pins, but this arrangement did not effectively equalize loads and excessive fatigue of the main cables occurred adjacent to the jewels with resultant breakage of individual outside strands of the cables. The modified arrangement eliminated all trouble of this nature formerly experienced.

Connection at tail tower

Connection of the main cable at the tail tower was through a take-up device used for adjusting the length, and hence the sag, of the main cable. Unlike the connection at the head tower the bolts that transferred stress from the track cable to the front sheave block of the take-up line, did not pass through the jewel block. Instead, the block rested against an $8\frac{3}{4}$ x 6-in. by 2 ft. 4-in. metal plate. On either side of the jewel block, a $3\frac{1}{2}$-in. eye bolt extended through this plate to a 6-in. pin that was connected to the shaft of the front sheave of an 8-part take-up line by means of four 12-in. by $1\frac{1}{4}$-in. plates as shown in Fig. 5. The threaded end of each

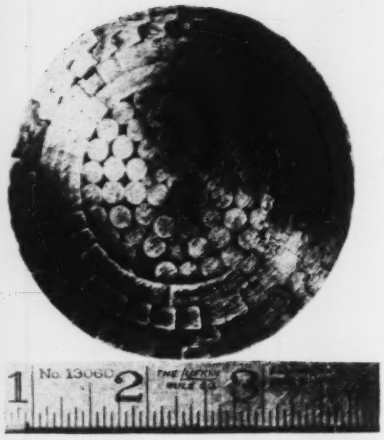

Fig. 2. Lock-coil track cable of 2¾ in. dia., which has an ultimate strength of 840,000 psi.

eye bolt extended through the 6-in. thick plate and a nut was placed to bear on the plate. The eye bolt then extended through a 2-in. plate and another nut was placed to bear on this plate.

A U-bolt was attached to each 2-in. plate and carried around the 6-in. pin, which was attached to the shaft of the sheave. These U-bolts served to eliminate the tendency for the assembly to rotate on its horizont axis while the eye bolts transferre the direct stress.

The rear sheave case of the take-u line was pinned to steel plates tha in turn, were pinned into the fram work of the tower. Two 2-in. plat were used for this connection at o tower and four 1-in. plates at th other. The take-up line was dea ended to the rear block by clampin it to a short piece of cable attache to the block.

Track cable take-up

The length of cable on the take-u was sufficient to extend to the base the tower and to allow for connecti with another working line. When was desired to take sag out of th main cable, that part of the take-u line extending to the base of the tow was reeved into a 6-part line an dead-ended, the end being tied to tractor. The tractor exerted a for on the line sufficient for tautness an released the tension on the tie-off the top of the tower. The short piec of cable at the top of the tower ser ing as the tie-off to the rear bloc of the take-up line was then u clamped and the line shortened b continued pull from the tractor. Whe the desired sag in the main cable w reached, by adjusting the length the take-up line, the cable proper w again clamped to the short tie- cable.

The carriage on each of the cable ways was suspended from eight roll sheave wheels that traveled on th $2\frac{3}{4}$-in. locked-coil track cable. To di tribute the load between the carria frame and the track cable, each pa of wheels was made common to sma plates, and each pair of the sma plates was pinned and made comm to a large plate that was pinned the carriage frame.

Tractor raised main cables

In erection of the cableways t reels of $2\frac{3}{4}$-in. track cable were s up about 400 ft. in front of the he tower, adjacent to the downstream t of the dam, and a tractor used to p the cables to the river. A messeng cable was then set up between t point and the tail towers, and t track cables pulled up to the take line at the tail towers, using a trac and the working lines. The c riages, which had been previou

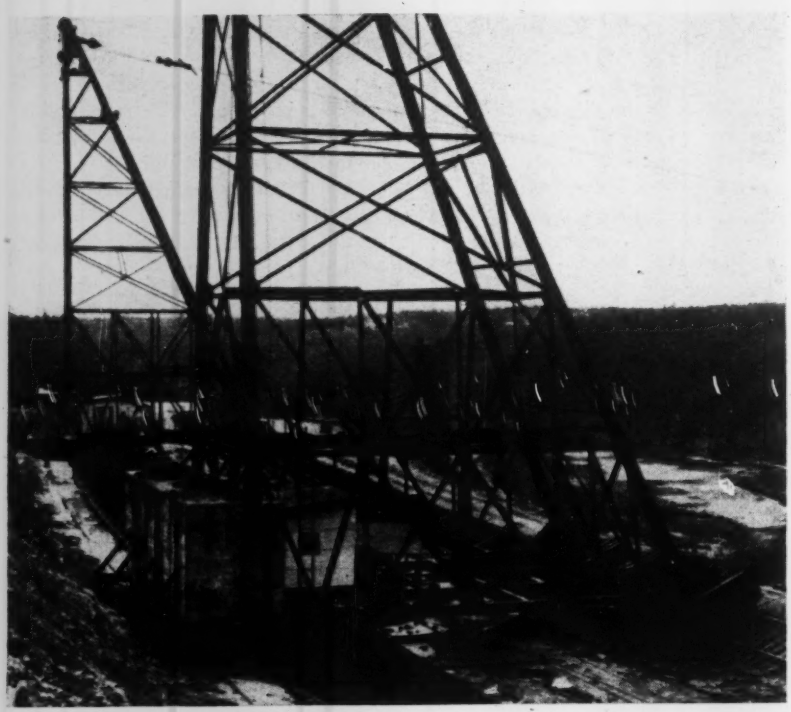

Fig. 3. The two tail towers traveled on the arc of a 2,834 ft. radius circle. Note that the track and carriage under the forward legs are normal to the slope of the legs to avoid side thrust.

rected, were assembled on the track ables at ground level.

At the head tower the endless cable nd load line ran from the hoist rums to points near the top of the ead tower where they passed over ouble sheaves. The double sheaves ere connected to the web of a 22-in. beam arranged in such a manner hat the sheave assembly could rotate bout the vertical axis of the head ower as movement of the tail tower hanged the axis of the cableway. At he tail tower the endless cable merely assed over two sheave wheels, used o separate the two parts vertically.

The single part load-line extended rom the hoist at the head tower to he carriage where it passed over a heave in the carriage frame, through double-sheave main-fall block, back o a sheave at the opposite end of the arriage and again through the main-all block to dead-end on the carriage, making a four-part lifting line for reater lifting capacity.

Button line in short lengths

The function of the button line was o release slack carriers at uniform ntervals along the cableway for the urpose of eliminating excessive sag n the smaller cables of the system. The buttons. ranging in size from 2⅛ n. to 4⅛ in. in dia., were spaced at 00-ft. intervals, the first being lo-ated 550 ft. from the head tower. The cable was separated at each but-on by a socket in each part of the utton, Fig. 7. Thus, in event of fail-re of the line, it was necessary to eplace only 200 ft. of the cable.

The maximum amount of wear on he button line occurred on the head ower side of the button where the lack carriers rebounded on the cable fter being released from the car-iage. This wear was reduced by inding soft iron wire around the able for a short distance in front of he button. The counterweight on he end of each button line at the ead tower was designed to balance he weight of the line, with a small llowance for friction.

Control and operation

Control of the cableway system was lectric and fully automatic with the ajor part of the machinery and quipment housed in the base of the ead tower. A 2,300-volt power line as run to the head tower where it as connected, through an air circuit-breaker and an oil circuit-breaker, to a set of reversing switches and to the 2,300-volt slip ring polyphase induction motors driving the two hoisting drums required for each unit of the cableway system. The load line was taken in on one drum while four turns of the endless cable wound on the other moved that line by friction. The motor drive and hoist mechanism were integrated and all gears revolved with the motor in operation.

The rotor of each motor was connected in series with a resistance grid controlled by five switches mounted on a secondary control panel. The switches served to vary the resistance in the grid by steps, thereby controlling the speed of the motor.

Rotation of the endless and load-line drums of the hoists was controlled by air-operated, electrically controlled friction clutches and brakes. The clutch assembly was located at a rim at one end of the drum while a similar rim at the other end was utilized for a brake. The clutching action took place on the gear end of the drum when air pressure was applied to a thrust plate attached to the shaft of the drum. A brake band, attached to a counterweight, acted on the other rim to provide the necessary braking action. The operator had a control for each brake and clutch, and a cam-operated control switch was provided for reversal and speed control of the motor.

Air was supplied by four air compressors each 6 in. and 3½-in. bore and 4-in. stroke, driven by a 10-hp., 440-volt, electric motor. Application was through individual lines to each friction clutch and brake, the flow be-

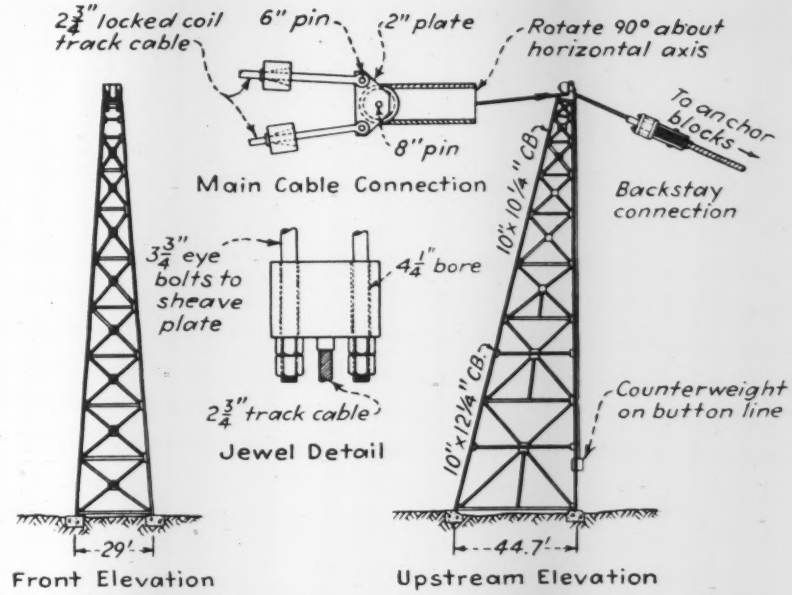

Fig. 4. The track cables of the two cableway systems utilized a single head tower with the cables equalized through a sheave connection.

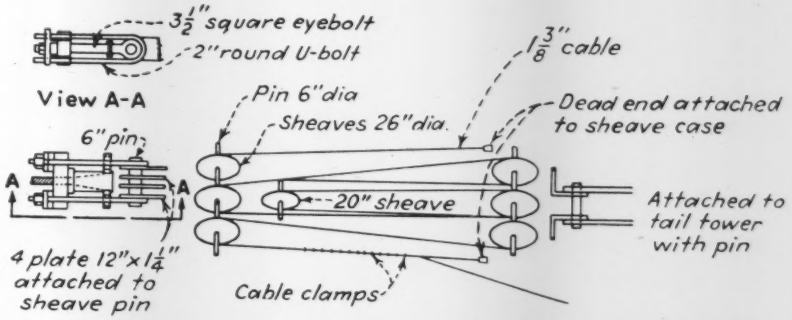

Fig. 5. Sag in the track cable was adjusted at a take-up block attached to each of the tail towers.

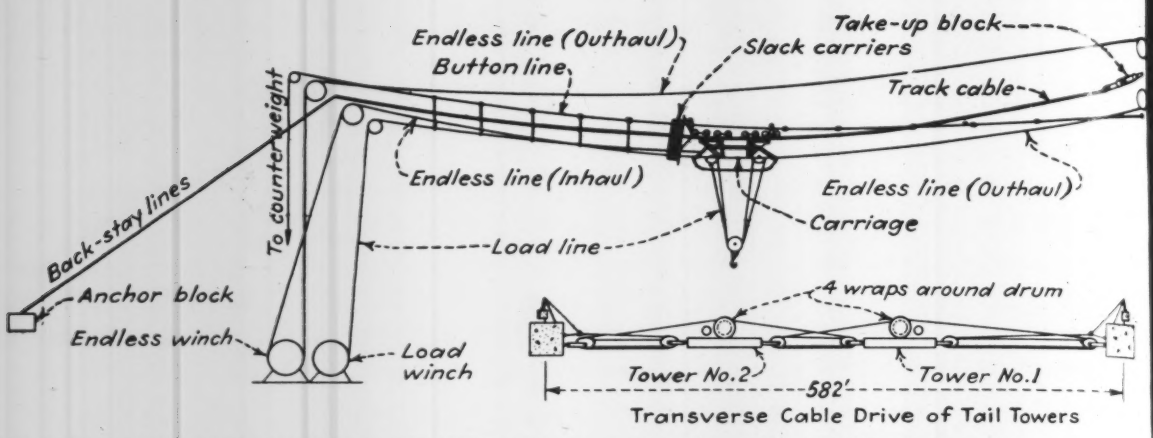

Fig. 6. Schematic diagram of principal parts of the cableway and traveling mechanism of the tail tower.

ing controlled by a solenoid-operated air valve. When the solenoid was energized, the valve operated to allow passage of air. In the case of the friction clutch, the air pressure acted against a pressure plate mounted on the shaft of the drum and engaged the drum with the drive ring through a friction clutch. On the brake, air pressure served to hold a counterweight off the band, and when the solenoid was de-energized shutting off the air pressure, the counterweight fell, thereby applying the brake. In the event of a power failure, the brakes were therefore automatically applied.

As the carriage moved out, the clutches on both drums were engaged and the load line traveled out at the same rate as the endless cable. When a point was being approached where it was desired to lower the load, the carriage was brought to a gradual stop by slowing and finally reversing the motor. After stopping the carriage, the friction on the endless cable drum was released and the brake set.

The load was lowered with the friction on the load drum remaining engaged and the motor operating, and the load was brought to a gradual stop through reversal of the motor. The hoists were operated by remote control from the operator's room.

Traveling of tail towers

The tail towers moved transversely on tracks which were laid in arcs of circles, of which the pin at the head tower was the center. A single length cable, reeved as 4-part lines between the anchor blocks and the towers, was turned four times around a 40-in. dia. hoist drum at each tower. The location of the anchor blocks, reeving of cables, and other details, are shown schematically in Fig. 6.

The hoist for traveling the tower of the downstream cableway was equipped with a 100-hp. electric motor and that for the upstream tower with a 75-hp. motor. These motors were controlled similarly to those in the head tower except that a dual control system was installed to permit continued operation of the towers in the event of power failure in the control line from the head tower.

The towers could be moved simultaneously or singly in opposite or like directions as desired. The revolving hoist drum took in cable causing the tower to move, the resulting stress being transmitted to one or the other of the anchor blocks depending on the direction of travel. The cable leaving each side of the hoist was reeved directly into a 4-part line. Therefore, with movement of the tower, cable was paid out on one side of the hoist while on the other side cable was taken up at the same rate. Limit switches were installed at each side of each tower to automatically cut the electrical supply when a tower reached the limit of the runway or when the towers came together.

A 60-in. carbon arc floodlight of 3 million candle power was installed about 100 ft. above the base of the head tower for night operation of the cableways. An intercommunication system was installed between the towers and from the base to the top of each tower.

Concrete placing averaged about 57 cu. yd. per hour with the cableway handling the concrete directly from the mixing plant. To speed produc-

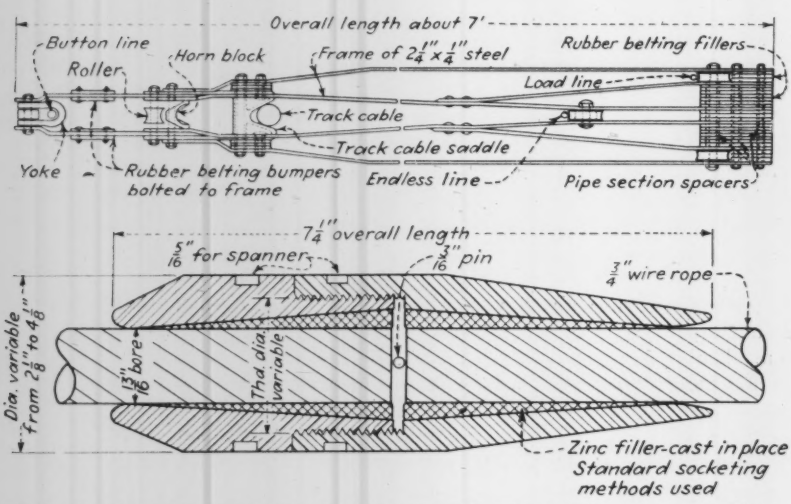

Fig. 7. Slack carrier and detail of button on cable. The function of the buttons is to pull the slack carriers off carriage at successive positions.

tion, trucks were used to transport concrete from the mixer plant, over a finished section of the dam, to about mid-point of the span where the concrete was transferred through a hopper to the cableway bucket. Due to the shorter travel, placing was stepped up to 80 cu. yd. per hour. Later, large trucks were equipped to haul 4-cu. yd. buckets on a hydraulic-lift hook on the rear of the truck, thus permitting delivery without transfer of concrete and further speeding the placing (see *ENR* Feb. 10, 1944, vol. p. 187.)

Failure of upstream cableway

One unusual happening in connection with the cableway should be mentioned. While in operation, the upstream cableway failed as a result of the shearing of the $3\frac{3}{4}$-in. dia eye bolts passing through the track cable jewel blocks at the head tower. The failure occurred at the time a bucketload of concrete, traveling from the mixers toward the left abutment, had reached about the center of the dam. The tail tower was at its upstream limit of travel and the loaded bucket and carriage fell into the reservoir, clearing the dam in falling. Fortunately, no one was injured.

The failure appeared to be primarily a result of fatigue (repeated stress). Both bolts failed at the end of the threads which were located at the approximate center of the jewel. As evidence of fatigue was present in only one bolt, an unbalanced condition of stress must have existed and, when one bolt failed, the other could not withstand the induced stress from the impact and also failed.

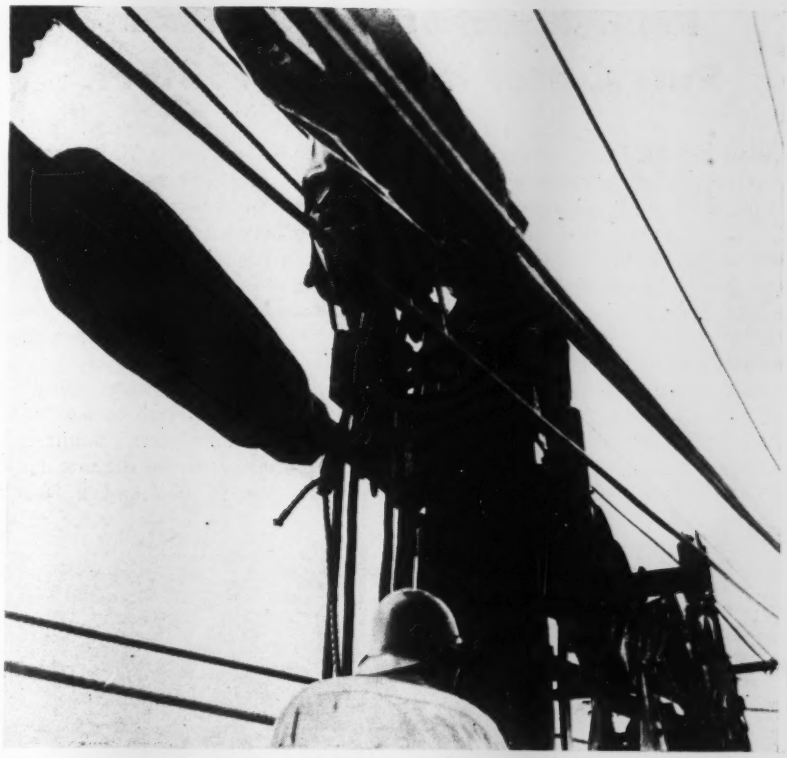

Fig. 8. Cableway carriage near head tower. Note "jewels," into which track cable is socketed and slack carriers that ride on the main carriage until pulled off by the "buttons" to support the load and endless lines.

The fallen cableway was not replaced but, as a result of this failure, precautions were taken to insure against a like failure of the other cableway. A 16-part line of 1-in. cable was installed as a safety lashing from the track cable jewel to the case of the equalizing sheave between the main cable and the backstay line as shown in Fig. 9.

Norfork Dam was constructed under the supervision of the Little Rock Engineer District, Corps of Engineers, United States Army, by the Utah Construction Co. and the Morrison-Knudsen Co., Inc., contractors.

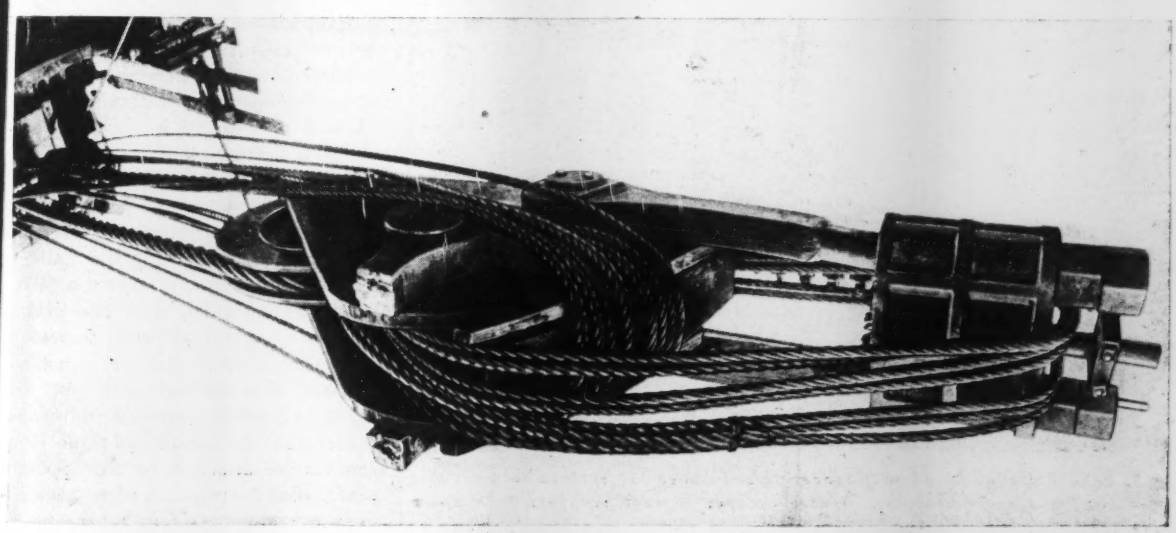

Fig. 9. After difficulty with one main cable connection the "jewel block" on the other cableway was lashed with a 16-part line to prevent falling in case of failure of the connection to the backstay anchors.

Rebuilt Suction Dredge Boom Puts Cutter Head Down 100 Ft.

A SUCTION DREDGE recently rebuilt for unusually deep excavation in San Francisco Bay has buoyancy tanks in the 125-ft. ladder that made it possible to launch the ladder like a ship and float it to place for attachment at the forward end of the dredge. These buoyancy tanks in the ladder are also useful in preventing the heavy operating strains in the hull that otherwise would occur when the cutter head is operating 100 ft. below the surface.

Before it was rebuilt the dredge had a 36x100-ft. hull and a 70-ft. dredging ladder which, at usual angles of operation, could work to maximum depths of between 40 and 50 ft. To refit the dredge for this special job in which about 1,000,000 cu.yd. had to be excavated from depths ranging up to 100 ft. below water surface, the hull was cut in two transversely and a 40-ft. length of prefabricated midsection was lowered into place and welded to adjoining parts. Similarly, the two I-beams of the digging ladder were cut in two and a 50-ft. length of steel box girder was inserted, thus increasing the ladder length to a total of 125 ft.

Several other incidental changes were also made. The A-frame supporting the ladder hoisting tackle was lengthened 15 ft. to provide additional height for handling the increased ladder length. Changes were made in the mounting of the ladder and the cutter drive gear was moved to a new position on it so that it can swing through a larger angle with the horizontal. The ladder can now make an angle of 60 deg. with the water surface.

A new three-way anchoring arrangement was used in place of the ordinary spuds because the new working depth would have been too great for spud operation. The new arrangement employs a spudding mast at the stern of the dredge secured at the bottom of the hull by two removable pins so that it can be swung out of the water to facilitate servicing the lower sheaves. Three wire ropes are run from a point on the stern to three widely separated anchors—two are forward, on port and starboard sides, and one is directly astern. These ropes are led to windlass drums, with controls in the pilot house.

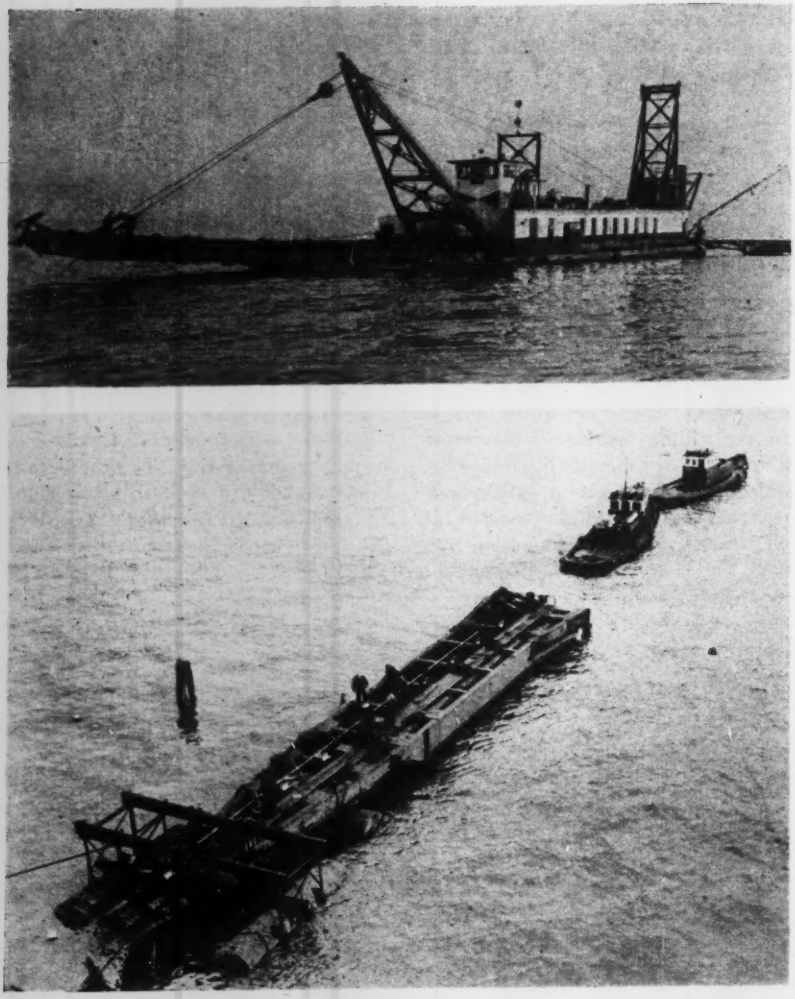

Fig. 1. Rebuilt dredge (top) with ladder raised above the surface for servicing cutter head and shaft bearings. Water escapes through scuppers from space above ladder buoyancy tanks. The 125-ft. ladder after launching is shown at bottom. Inserted section has built-in buoyancy; three temporary tanks support cutter end.

Digging ladder redesign

Primary interest attaches to the digging ladder because in the redesign of this member built-in buoyancy was provided. This not only simplified the method of construction and placement on the dredge but made it possible to work the ladder at the unusual depth without introducing excessive strains in the dredge hull.

These objectives were accomplished by reconstructing the digging ladder on a shipbuilding slip so that when completed the ladder could be launched by being pulled to the end of the ground ways and floated off at high tide. Reconstruction on the ladder consisted of cutting the pair of I-beams apart and inserting a 50-ft. length of a welded steel box girder which, of course, affords buoyancy by reason of its airtight construction. Because this arrangement put the buoyancy center near one end of the ladder, before launching three steel tanks were attached to the opposite end to obtain even trim when afloat.

In a manner similar to the treatment of the boom, the hull of the dredge was put on prepared greased

skids in a drydock, cut in two, and the two sections pulled apart. The new intermediate section was then lowered into place, thus lengthening the hull by 40 ft., after which adjacent portions were welded together. Strengthening plates were riveted to the deck and bottom shell.

Can be reconverted

All of this reconstruction has been done in such a way that the dredge can be readily reconverted to its former condition if it appears later that there will be no further need for the special arrangement for unusual depths.

The rebuilt dredge started work 51 days after it went to the shipyard for alterations. After six weeks of operation, with no mechanical break-downs, it was found to have averaged 11,000 cu.yd. of solids per day. The first cut was made to the 65-ft. level, the cutter head was then swung down to the 85-ft. level and as this was written it was making the third and final cut at the 100-ft. depth.

The dredge is the *Papoose* owned by the Hydraulic Dredging Co., for whom the rebuilding was done by the Bethlehem Steel Co., shipbuilding division, San Francisco. The deep dredging contract on which the dredge will be used is held by the contracting firm of Gerwick-Morrison-Twaits Co.

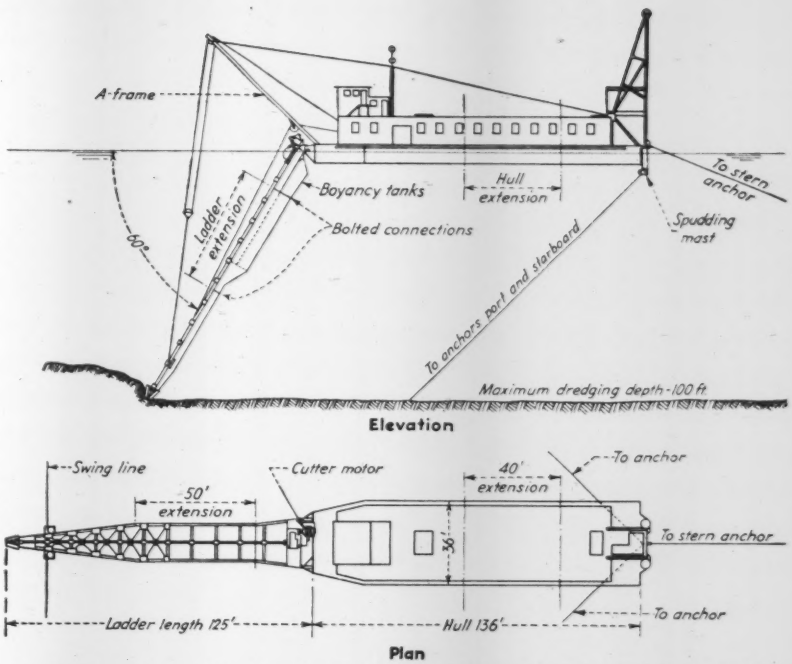

Fig. 2. Plan and elevation showing location of additions inserted in hull and ladder, also spudding mast.

Urban Redevelopment Laws Enacted in 17 States

Seventeen state legislatures have, during recent sessions, enacted legislation to enable urban redevelopment, according to the American Society of Planning Officials—Alabama, Arkansas, California, Colorado, Connecticut, Florida, Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, New York, Ohio, Pennsylvania, Tennessee, and Wisconsin.

Power to carry out or supervise urban redevelopment was given to private enterprise by three of these states, public housing authorities were designated by three states, and seven states placed the responsibility upon state-local government. In four states a combination of private enterprise or public housing authorities or state-local government share the responsibility for urban redevelopment. These states are: California, Connecticut, Illinois and Michigan.

California passed a law which provides for assistance to private and public enterprise in rehabilitating and redeveloping blighted areas. The act provides for creation of redevelopment agencies to carry out the rehabilitation projects.

Illinois authorized mutual building, loan and homestead associations to purchase land in the state, provided it is acquired as a result of slum clearance, and also authorizes municipalities, cities and villages to acquire by purchase, condemnation or otherwise any real property necessary for redevelopment of blighted areas.

The Connecticut law states that the governing body of any municipality may designate as a redevelopment agency the local housing authority, the state housing authority, or may create a new redevelopment agency.

Michigan amended a law pertaining to creation of urban redevelopment corporations which provides for setting up of plan commissions and supervising agencies to approve a development plan before the development of a substandard area can be initiated. Michigan also authorizes counties, cities, villages and townships to adopt plans for the rehabilitation of blighted areas and to carry out a slum clearance and improvement project by acquiring title to a slum or blighted area and redeveloping it.

Three states—Alabama, Massachusetts and Minnesota—give private enterprise sole responsibility for urban redevelopment. Alabama delegated to private enterprise exclusively the responsibility for abolishing slums and providing low-rent housing in Birmingham and Jefferson County.

Arkansas, Florida and Tennessee made housing authorities responsible for supervision of redevelopment.

Villages, cities or state commissions may be designated as responsible for urban redevelopment under laws passed in Colorado, Indiana, New York, Ohio, Pennsylvania, and Wisconsin. Maryland authorized the mayor and city council of Baltimore to establish a Baltimore redevelopment commission.

Field Determination of Soil Density By Electric Moisture Meter

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SOMEWHAT DIFFERENT from the types of electric moisture meters for soil density determination described previously in *Engineering News-Record* (July 11, 1935, p. 52 and May 13, 1937, p. 708) is a meter that was used in tests at the Troy, Ala., airport. This electric moisture meter makes an immediate and very close estimate in the field of the percent of moisture in the soil. With the percent of moisture known, the density of the soil may be found without the necessity of waiting for a wet soil sample to dry.

This moisture meter consists of a 45-v.—22½-v. radio battery in a plywood case with a small grid meter and a switch mounted on top of the case. The battery and grid meter are connected through the switch to a test plug (Fig. 2) so that the moisture content is measured by the electrical resistance across the copper electrodes of the plug when they are placed in the soil.

Calibration of the meter is performed by inserting the electrodes in compacted soil in a standard Proctor cylinder, taking a reading on the 45-v. and on the 22½-v. tap and comparing with the percent of water found by drying a small sample from the compacted cylinder. Successive compacted soil samples are then made by adding water, and the test is repeated. Calibration tests must be made for each type of soil to be used.

On the assumption that the percent of moisture is a linear function of the meter reading, calibration curves are plotted as straight lines.

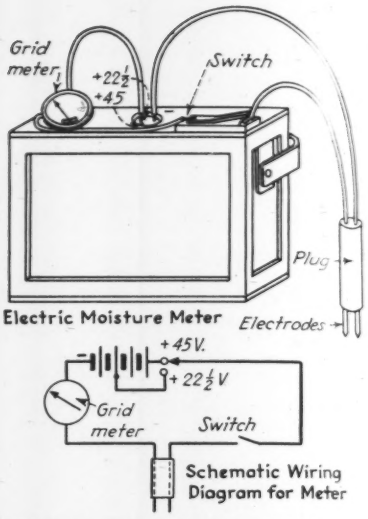

Fig. 2. Electric moisture meter predicts outcome of soil density tests in the field accurately.

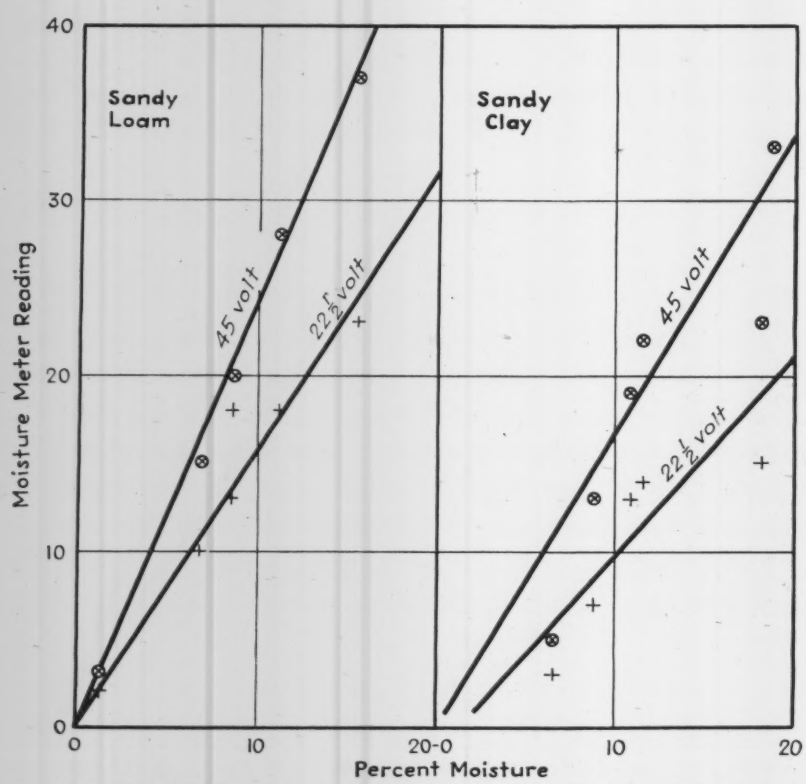

Fig. 1. The intersection of the ordinate representing the reading of the moisture meter with either the 45-v. or the 22½-v. curve, depending on the tap used, indicates the percent moisture in the soil.

Typical curves are given in Fig. 1 for sandy loam and sandy clay samples.

In field determinations of moisture content, a reading is taken on each of the taps with the electrodes successively inserted at three or four places in a compacted area. The percent of moisture for the average of the readings is then read from the graph for that particular type of soil.

Used in 171 tests on the airport mentioned, the meter predicted the outcome in 91.9 percent of the density tests. In 82 tests on sandy clay the instrument was 88 percent correct, and in 89 tests on sandy loam it was 94 percent right. The time saved and the high percent of accuracy should warrant the use of an instrument of this type as a supplementary apparatus for laboratory-controlled earthwork projects.

A future application of the meter to determination of soil density directly from the grid meter reading may be possible, since preliminary tests show that the density of a soil is proportional to the meter reading, for a given percent of water. Some experimental work will be necessary to determine whether this relation is constant enough to be valuable for practical purposes. If it is, and can be evaluated, the meter may be used in moisture-density surveys of the subgrade under pavements by connecting the leads to non-corroding electrodes permanently placed in the sub-grade.

Lessons From a Sludge Tank Explosion

Henry W. Taylor
Consulting Engineer, New York

***Contents in Brief**—In attempting to remove a blanket of floating sludge from a fixed-cover digester at the Herkimer, N. Y., sewage treatment plant, the tank liquor was drawn off. An explosive mixture of sludge gas and oxygen, which accumulated in the dome of the tank, was then ignited through the accidental breakage of an electric light bulb and the tank cover was blown off. The accident calls attention to certain operating hazards and provides experience that may be helpful in designing similar units.*

AN EXPLOSION of sludge gas that blew off the fixed concrete cover of the primary digester tank at the Herkimer, N. Y., sewage treatment works on Nov. 19, suggests the desirability of discussing the causes and conditions leading to this accident as a means of forestalling a similar situation elsewhere.

Happily there were no casualties at Herkimer, although four men were working on the roof of the tank at the time of the explosion. And equally fortunate was the fact that damage was confined to the tank itself.

To understand what transpired it should be pointed out that this digester, which was designed by the writer and installed in 1936, is 28 ft. in diameter and 18 ft. deep from the lower section of the floor to the highest point of the fixed concrete roof. Copper heating coils were supported from the side walls. An 8-in. sludge withdrawal pipe extended through the roof and was capped.

The gas dome was set slightly off center to avoid the sludge pipe; it was fabricated of $\frac{1}{4}$ in. steel plate as a cylinder 3 ft. in diameter, with steel plate cover. Gas piping extended from the gas dome, underneath the fixed cover, to and through the side wall of the tank into an adjacent control house. A water-jetting pipe extended through the dome cover and was equipped, at its lower end, with a horizontal nozzle which could be rotated and raised or lowered.

The fixed concrete cover was supported by two concrete columns, a central steel girder and I-beams, which divided the area into twelve slabs of 6-in. thickness. On top of the cover there was 18 in. of dirt fill.

This tank was one of two adjacent units, separated from each other by the control house. The undamaged secondary tank is equipped with a floating cover, the 5.5 ft. skirt of which provided storage for 3,000 cu. ft. of sludge gas.

About 1,000 cu. ft. of gas was normally stored at night under the fixed cover of the primary tank by means of a pressure reducing valve which created gas pressure to displace sludge liquor to the secondary tank.

Details of the explosion

The following statement concerning the explosion itself is based on comments received from D. B. Rosback, village engineer, who arrived at the plant soon after the event. The writer inspected the sewage works the next morning and confirmed the essential points by further talking with three of the men who were on the tank when the explosion occurred.

Four men had been working on the top of the tank for several days pumping out a blanket of floating sludge. The gasoline-driven pump was blocked up near the gas dome, the cover of which had been removed. On the day of the explosion the first attempt to start the pump proved unsuccessful, and an electric light bulb was lowered through the gas dome to determine the cause of the failure to establish suction. The bulb was left hanging in the tank while the pump was reprimed.

The pump was not running and the primer plug had just been replaced when a hissing sound was heard, and the gas inside the dome and tank became foggy and turbulent. This hissing sound was followed by a burst of reddish-yellow flame that rose 30 ft. in the air, and then by the explosion.

Fig. 1. Explosion of sludge gas in the primary digester of the Herkimer, N. Y., sewage works ripped off the fixed, concrete cover, but otherwise did little structural damage to the tank or adjacent units.

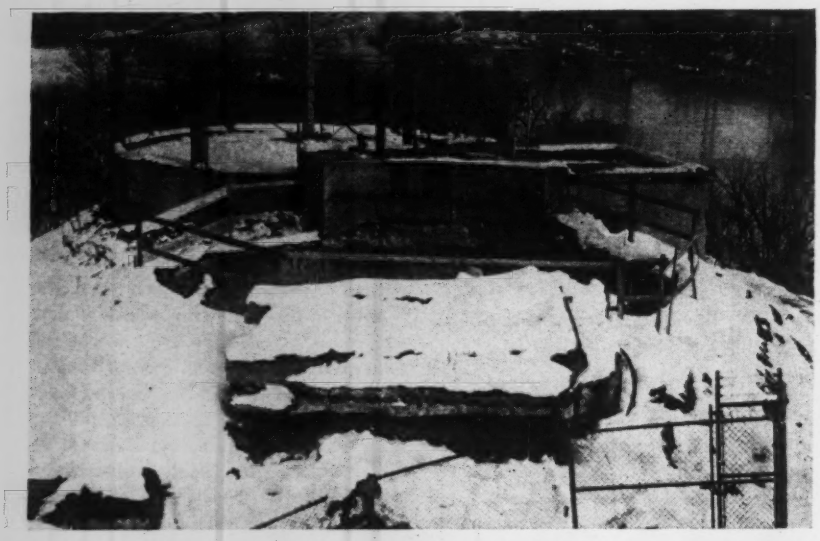

Fig. 2. Adjacent to the wrecked primary digester in the foreground are the control house and secondary digester, which were not affected by the explosion. The secondary tank, containing 3,000 cu. ft. of gas, was unharmed.

Three of the men ran down from the tank when the hissing started. The fourth man ran to the top of the control house and was there stopped by the fence around the secondary tank. This man received surface face burns from which he quickly recovered; the other men were not hurt or even bruised.

The explosion lifted the northwesterly half of the roof, and it landed west of the tank, folded over on itself. The southeasterly half of the roof apparently was restrained by one column and the sludge withdrawal pipe, together with the superstructure of the control house. It was broken in several sections. One of these sections, containing the gas dome, now hangs down from the column; the remaining sections are completely submerged in the sludge.

No damage to tank walls

The sludge pump and its long suction pipe was lifted into the air. It was said that it "looked like a kite with a long tail" before it fell near the man on the control house roof.

Inside the tank the heating coils had dropped down from their wall supports, but it is claimed that this condition was observed prior to the explosion.

The section of the primary tank wall, inside the control house and unsupported by earth backfill for a distance of 15 ft., contains no visible vertical cracks from bursting pressure. No cracks are elsewhere visible in the cylindrical walls of the tank and except for an area about 4 ft. long, the roof left the top of the walls with a smooth and level outline along a construction joint.

Fortunately the 2,500 cu. ft. of stored sludge gas under the floating cover of the secondary tank was not detonated.

Cause of the explosion

In the writer's opinion, the simplest theory of the cause leading to the explosion assumes that a "gulp" of gas or air raced up the pump suction pipe after the second priming, producing the familiar "kick" in the hose. The hose struck the bulb, which bounced away and broke against the roof or on the back-swing to the hose. When ignition occurred, an excess of oxygen near the gas dome was first burned and then an explosive mixture of gas and air blew the roof off.

It is hardly necessary to dwell on the danger of introducing into a sludge digestion tank an electric bulb —even one protected by an explosion-proof casing. However, the potential for an explosion was created initially by an operating condition that escaped detection for months.

Quite possibly the condition was inevitable and subject to recognition in planning on this basis: For eight years the tank has operated without a blanket of top sludge, without difficulty in heating or in transfer of sludge liquor or primary sludge. However, some months ago the water-jet nozzle worked loose from the jetter pipe and fell into the tank. Thus the jetting that was done thereafter merely served to discharge hot sludge liquor vertically downward into the center of the tank. Through these months, therefore, the sludge blanket thickened.

As a result, heating of the tank began to prove inefficient through lack of heat convection. Loss of heat further aggravated the sludge blanket accumulation, which became more compact.

Without the jetter nozzle neither heat agitation or injected moisture were available. In an effort to relieve this situation, both digestion tanks were drawn down. This procedure lowered the sludge blanket onto the copper pipe coils and probably was a partial, if not total, cause of their displacement. Gas produced in the lower section of the tank then began to rise in intermittent bursts as it accumulated sufficiently to pierce the blanket. Float chambers overflowed in sudden pulsations and gauges fluctuated erratically.

Finally, the plant superintendent concluded that complete dewatering of the tank the only feasible solution. The explosion occurred during this process.

Lessons to be learned

Although the tank could have been dewatered without an attendant explosion, the fact still remains that thoughtless things will be done in spite of education and warning.

The writer believes that in sludge tank design three factors should be given more consideration than is generally afforded. They are:

(1) Provision of facilities for the prevention of floating sludge, these facilities being removable through the cover for inspection and repair.

(2) Elimination of all equipment from a sludge tank that cannot be removed, for inspection and repair without dewatering the tank. This includes everything except the sludge withdrawal pipe.

(3) Assumption of the possibility that in years of operation a floating sludge blanket will accumulate in spite of efforts to the contrary, and provision should be made for

the removal of this blanket without the necessity of drainage of the tank, complete dewatering, or entrance into it.

Prevention of sludge accumulation involves these considerations: addition of moisture; maintainence optimum temperatures; and agitation. It is desirable that the agitating mechanism should be removable for inspection and repair through a relatively small opening in the tank cover or gas dome cover, and it should be so arranged that in the process of removal the port is automatically closed during inspection and repair.

Agitation and heat must be supplied from the start and maintained faithfully. A sludge blanket once formed is broken up only with considerable difficulty; as it accumulates heat convection is reduced, agitation proves less efficient, and temperature and moisture are reduced.

Sludge heating suggestions

Pipe coils in a digestion tank can become caked on the outside, coated on the inside, can leak, or break loose from their supports. In any case, they cannot be inspected without dewatering the tank. The answer to this situation may be found in heating the raw sludge before it enters the tank, thus eliminating the use of internal coils. In the writer's opinion, hot secondary sludge liquor should be used for heating purpose, the liquor settled and then superheated in an outside tank which can be drained without disturbing the sludge tank itself. A sufficient amount of this liquor can be pumped into the digestion tank to furnish the necessary heat and be introduced at the top of the tank where it is most needed.

Should this method of heating be combined with the use of a water jet for floating sludge, the requirements of supplying heat, moisture and agitation are satisfied. The agitation tears loose the gas bubbles which are entrained with sludge particles and releases these particles for resettlement. And the heat and moisture maintain optimum digestive conditions.

It is also desirable that gas pipes should be kept outside the tank proper, subject to inspection, flushing and repair without dewatering or entering the tank.

The possibility that floating sludge formations will occur in spite of adequate design and operation should not be ignored in designing the tank. Consideration should be given to the installation of facilities for the removal of top sludge from the top. Draining a sludge tank attacks the problem from the wrong end and is often impracticable because of groundwater uplift against the tank floor. The bottom sludge need not be wasted in any case and it should not be necessary to cut the tank out of service for making this change in procedure.

In considering such a design two cases at once present themselves—the fixed cover and the floating cover. In the case of the fixed cover, sidewall valved openings not less than 12 in. in diameter on the periphery of the tank may be advisable. If these draw-off points were operated too rapidly or continuously, liquor would break through. If operated intermittently over a period of days, the lane of top sludge in line with the port would be alternately drawn off and then refilled by closing in of the blanket. The jetting or other agitation of the tank would tend to further equalize the blanket and the port can again be used for top sludge withdrawal. Withdrawn top sludge can be recirculated through the settling tanks and returned to the digestion tank.

In the case of the floating cover, the viscous section of the blanket will be enclosed inside the skirt plates. Here, removal from the top is required and the cover can be fitted with capped sleeves large enough to receive siphon piping for removal. The number of these sleeves will, of course, depend on the size of the cover.

Conclusions in brief

In the foregoing, changes in design are discussed which are regarded worthy of consideration at large and which apply to the writer's designs as well.

The Herkimer digester operated for eight years but failed in the ninth. This failure to function properly is probably an operating accident; or it may have have been the culmination of a tendency slowly accumulative over a period of years. No matter which is the case, the lesson is the same—avoid equipment that is not easily accessible for inspection while the tank is in operation. Furthermore, provide facilities for top-sludge removal, even though there is good reason to believe that such a condition should not occur.

Comments on Mr. Taylor's recommendations and any other suggestions pointing to the design safeguards for sludge digestion tanks will be welcomed for publication.—Editor.

TVA Develops Process For Making Flooring from Culls

A process and equipment developed by the Tennessee Valley Authority for producing high grade laminated flooring from cull hardwoods are being demonstrated to wood products manufacturers at an experimental plant in Knoxville, it has been announced. This project, which has been carried through the pilot plant stage of experimental operation, was undertaken in 1941 by the TVA "to provide a profitable outlet for the enormous quantities of low-grade mixed hardwoods now standing in Tennessee valley woodlands," according to John P. Ferris, Director of TVA's Commerce Department, one section of which carried on the experiment.

This is one of a number of industrial research projects intended to produce manufacturing opportunities. In its development of resources, TVA carries these projects through stages of research, demonstration and economic analysis, relying on private industry to put results into use.

Preliminary design and construction was done under contract with the Engineering Experiment Station at Georgia School of Technology. The U. S. Department of Agriculture's Forest Products Laboratory, Madison, Wis., which conducted some experimental work on the product, suggested the activity to TVA and has given advisory assistance; it is making exhaustive tests of the output. Laboratory tests are being conducted also by the Wood Research Laboratory of Virginia Polytechnic Institute.

Tests on New Type Open Bridge Floor

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***Contents in Brief**—Load tests on a new type of open steel flooring verify calculations that deep distributing trusses materially reduce the proportion of wheel load carried by any one flooring beam. Results of skid tests on painted and galvanized flooring, both plain and knurled, are also given.*

WIDESPREAD USE of open steel floorings on highway bridges has resulted in many different types being put on the market and in continuing development of new types. Among the latter is a design that differs from others in that it uses comparatively deep distributing trusses to reduce the amount of wheel load carried by any one floor member and thus to permit a maximum spacing of stringers and cross beams. As shown in Fig. 1, the flooring in the direction of the span consists of 5-in. main beams of special section at a standard spacing of 6 in., and, between them, small supplementary bars at 2-in. spacing. At right angles to the main beams there are shallow crossbars at 3-in. spacing, and, near the middle of each flooring span, two deep distributing trusses at 15-in. spacing rigidly connected to the main beams and having the function of distributing the heavy concentrated truck wheel loads for which such highway bridge floorings must be designed.

Because theoretical analysis of this flooring, involving load distribution over multiple beams on elastic supports (i.e., the distributing trusses), while not difficult, is quite laborious, the authors were engaged to carry it through on a complete and accurate basis and to check it by actual load tests. Utilizing procedures described in "Modern Framed Structures" by Johnson, Bryan & Turneaure (John Wiley & Sons, N. Y., 1929, p. 360) analyses were made of the flooring, both with and without the distributing trusses, for loads applied to it over areas equivalent to the tire contact areas on wheels corresponding to those on the rear axle of an H-20 truck. It was found that, for main flooring beams at right angles to traffic, that is with the flooring supported on longitudinal stringers and with continuous flooring spans of lengths suitable for use on bridges, one main flooring beam carried about 30 percent of a wheel load if no distributing trusses were provided, and only about 20 percent if they were provided. The test program was drawn up to verify this distribution by actual test, and in addition was made sufficiently comprehensive to determine other properties of the flooring.

Test program and procedures

The following program of tests was carried out:

1) Test of a flooring unit as a 104-in. simple span on ideal supports with a line loading at the center of the span.

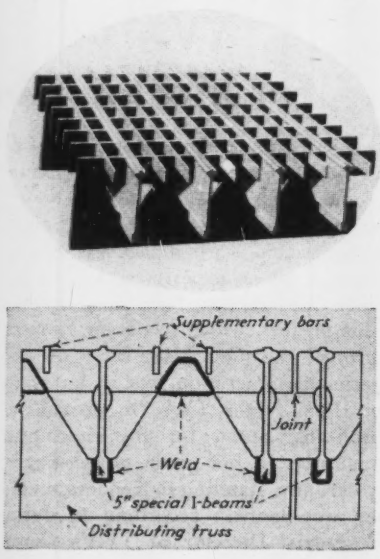

Fig. 1. New-type open steel bridge flooring uses deep truss bars to distribute wheel loads to adjacent flooring beams.

2) Test of a flooring unit as a two-span continuous beam on ideal supports, with loads at the middle of each span corresponding to the wheel loads of a highway truck. Each span was 52 in. long.

3) Repetition of Test 2, except that the flooring was welded to the stringer supports as it would be in an actual structure.

4) Test of a flooring splice.

5) Skid tests.

Arrangement of the loading frame and floor panel as set up for Test 2 is shown in Fig. 2. To simulate ideal conditions, the specimen rested on half-rounds at the supports. The load, applied with mechanical screw-type jacks to elliptically shaped wood blocks bearing on rubber pads on the top of the floor, was measured with calibrated elastic rings. Deflections were measured for all nine main beams of the test specimen at five places along the length of each span by means of a dial indicator reading to 0.0001 in. As shown in Fig. 2, deflections were referred to a "cradle" placed under each span and resting on the supports. This avoided error due to settlement of the supports.

Stresses were determined at 100 locations on the specimen by means of electrical resistance strain gages sensitive to 0.0000005 in. strain.

In the setup for the skid tests the dual-tired rear wheels of an unloaded truck were placed on the test panels, the front wheels being placed on ball-bearing rollers. The rear wheels were then locked against rotation, and load, measured with a calibrated elastic ring, was applied to the truck by means of a winch. The load necessary to cause slipping divided by the load on the rear wheels was taken as the coefficient of friction.

Results of the tests show that distribution of the wheel loads conformed, for all practical purposes, exactly to theory. Similarly, the measured stresses in the distributing

trusses agreed almost exactly with the calculated stresses.

It has frequently been assumed in the design of floorings of this general type that the supplementary bars participate to a substantial extent in carrying the stresses in the top flanges of the unit, thereby increasing the moment of inertia and section moduli of the flooring above those for the main flooring beams alone. It is evident that the supplementary bars can carry such stresses only to the extent that these stresses can be transferred to them by horizontal bending of the crossbars.

Minor role of supplementary bars

Theoretical analyses show that the extent of such participation varies throughout the span. For a simple beam loaded as for Test 1, the participation is a minimum at the center of the span and a maximum at the ends. Accordingly, the effective moment of inertia of the flooring is also a minimum at the center and a maximum at the ends. As the maximum deflection of the span at the center depends upon the "average" effective moment of inertia throughout the span, the value of I obtained from the measured deflections will be somewhat higher than the effective I at the point of maximum bending moment, which must be used for determination of extreme fiber stresses in the flooring.

For a main flooring beam, the section moduli are 1.68 for the top flange, and 1.73 for the bottom flange. For Test 1, at the point of maximum moment they were found to be 2.13 and 1.90 respectively. The increase in critical section modulus is then from 1.68 to 1.90 or 11 percent.

Similarly, for a 24-in. span loaded as for Test 1, the critical section modulus would be increased only about 3 percent. And for the conditions of Tests 2 and 3, having span lengths and loadings conforming closely to those found in actual practice, the calculated increases in critical section modulus, closely verified by the tests, are 2 percent at point of maximum negative moment and 6 percent at point of maximum positive moment.

As these increases are quite small, it seems wise to design such floorings on the assumption that supplementary bar stress participation is negligible.

In the design of floorings, it is customarily assumed that the effective span length of the flooring is the clear distance between the edges of the stringer flanges plus one-half the stringer flange width. It was expected that a comparison of Tests 2 and 3 would give data to check the correctness of this assumption.

A comparison of the test data, however, shows varying results. Some of the data indicate such an effective span to be exactly right, while other test results indicate that the effective span should be either longer or shorter than assumed. Insofar as a conclusion can be reached from the test data, it appears that the usual assumption as to the effective span is about right.

Results of the fourth test, that on splices, show that the load carried by each of the two beams adjacent to a splice is somewhat less than on an interior beam. This means that the beams at a splice will not govern.

The final test of the series was made to determine the skidding properties of the flooring under different surface conditions. In view of the many discussions among engineers as to nonskid properties of painted and galvanized steel floorings, data on this skid test, given in the accompanying table, should prove of interest.

In the table, the coefficient of friction, f, is given for each surface under varying conditions. Comparison of each f with the f for dry concrete is also given.

The flooring described herein, and known as Weldlock, was developed by the Reliance Steel Products Co., McKeesport, Pa., under the personal direction of H. S. Nagin, executive vice president. H. C. Tammen directed analyses of the flooring, development of the test program, and analyses of tests results, while the tests were under the direction of Prof. C. W. Muhlenbruch.

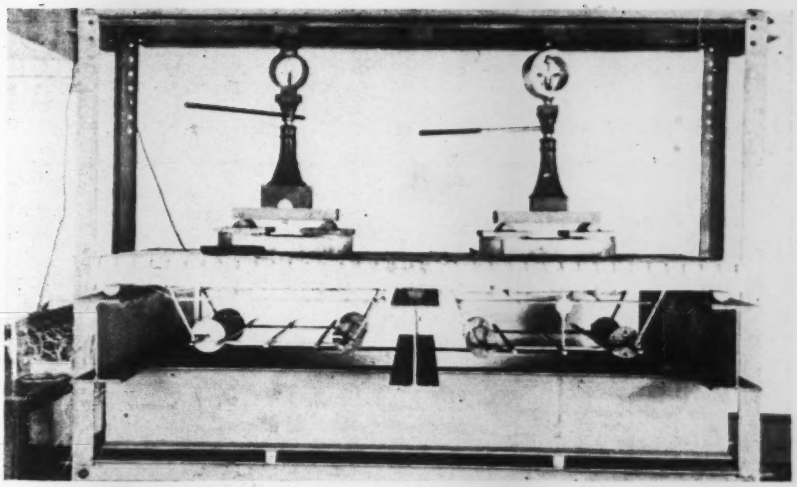

Fig. 2. Open steel flooring specimen on ideal supports ready for test with load applied by screw jacks bearing on elliptical load pads simulating truck tires. Note "cradles" to which deflections were referred.

COEFFICIENTS OF FRICTION AS SHOWN BY SKID TESTS ON OPEN STEEL FLOORING, BOTH PAINTED AND GALVANIZED

Direction of wheel travel with respect to beams	Condition of Surface	Type of Flooring Surface: Concrete	5-in. Weldlock Painted		5-in. Weldlock Galvanized		4-in. Riveted Floor *		5-in. Weldlock Knurled-Ptd. ‡		5-in. Weldlock Knurled-Galv. ‡	
		f	f	%†	f	%	f	%	f	%	f	%
Perpendicular	Dry	0.71	0.96	135	0.90	127	0.65	92	0.97	137	0.98	138
	Wet	0.60	0.85	120	0.85	120	0.46	65	0.94	133	0.74	104
Parallel	Dry	0.71	0.61	86	0.56	79	0.56	79	0.80	113	0.81	114
	Wet	0.60	0.55	78	0.49	69	0.45	63	0.80	113	0.55	78

† Ratio of coefficient of friction to that of dry concrete.

* Consisted of 4x5/16-in. main bars at 2 5/8-in. centers with 1 3/4x3/16-in. reticulated bars. Surface very smooth due to action of traffic.

‡ Top surfaces of crossbars and supplementary bars provided with depressed areas 3/32 in. deep 3/16 in. long at 3/8-in. spacing.

From Field and Office

WORKING PROBLEMS AND TIME-SAVING METHODS FOR ENGINEERS AND CONTRACTORS

Posts Under Signal Tower Replaced During Operation

A timber tower some 65 ft. high was built as a control station for directing airplane operation at a landing field in the South Pacific. Topography and forest growth made this height of tower necessary for the required view of approaches to the runways. It was possible to attain the desired height, at the time the tower was put up, only by making use of cocoanut logs in the four legs for the first two panels, a height of about 26 ft.

These logs were put in only as an emergency measure; it was realized that they are not satisfactory for permanent construction. The one point in their favor was that they did make it possible to attain the necessary height with material available at the time. Later, when the 8x8-in. timbers required for these tower legs were available there was a nice problem in replacing the old cocoanut members without interrupting the important operations carried on in the tower.

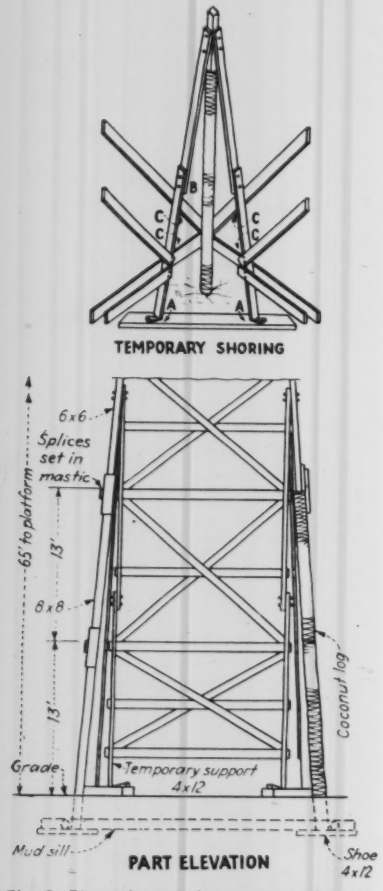

Fig. 1. Elevation of the completed tower and details of the shoring used while the four cocoanut logs were being replaced by 8x8-in. timbers.

Fig. 2. Airplane control tower in operation with new supports in place.

The method used, as indicated in the accompanying drawing, was to put in a temporary shoring made chiefly of 4x12 timbers erected inside the space inclosed by the base of the tower. The cocoanut corner posts could then be removed, one at a time, while the tower rested temporarily on the shoring. As each of the permanent 8x8-in. corner posts was placed, the splice with the adjoining 6x6 was set in mastic to minimize settlement under load. When the temporary shoring was eased away there was no appreciable settlement.

This method was made safer by the fact that the tower was steadied by wire rope guys.

In the sketch showing the temporary shoring, the wedges "A" were driven in under the temporary 4x12s to ease the weight of the tower off the cocoanut log "B." The original bracing was then cut at C and the cocoanut logs could be removed.

This footing replacement operation was carried out by a Seabee battalion under direction of Capt. J. L. Nielsen, USNR. Comdr. R. A. Harris was in charge of design and construction of the operation.

Use of Haversines Not Fully Exploited

On vol. p. 409 of the March 22, 1945, issue of *Engineering News-Record* appears the article "Use of Haversines in Azimuth Calculations" in which an example is worked out. The method illustrated does not fully exploit the use of the Haversine. The following formula for obtaining azimuth angle will be found more convenient; to save space the word haversine is abbreviated as hav. in the formula.

$$\text{Hav. } Z = \frac{\text{hav. } p - \text{hav. } (z - c)}{\text{hav. } (z + c) - \text{hav. } (z - c)}$$

where p = polar distance; z = zenith distance; and c = co-latitude.

Applying this formula to the example used in the previous article:

$p = 77° 54' 23''$	hav. = .39524
$z = 58° 34' 57''$	
$c = 52° 01' 40''$	
$(z - c)$ $6° 33' 17''$	hav. = .00326
$(z + c)$ $110° 36' 37''$	hav. = .67601

$$\therefore \text{Hav. } Z = \frac{.39524 - .00326}{.67601 - .00326}$$

$$= \frac{.39198}{.67275}, \quad \begin{matrix} \log = 9.59327 \\ \log = 9.82782 \end{matrix}$$

$$\log \text{ hav. } Z = 9.76545$$

$$\text{hav. } Z = 0.58270$$

$$Z = \text{N. } 99° 31' \text{ E}$$

Similarly, the hour angle may be obtained from:

$$\text{Hav. } t = \frac{\text{hav. } z - \text{hav. } (p - c)}{\text{hav. } (p + c) - \text{hav. } (p - c)}$$

The formulas listed are known as "all haversine." They were developed by F. G. Brown, late chief naval instructor, Royal Australian Navy, and director of studies, Royal Australian Naval College.

G. J. THORNTON SMITH
Engineering School
University of Melbourne
Victoria, Australia

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CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

Earthwork & Structures
Mirage Flats Project, Nebraska

OWNER: Bureau of Reclamation, Hemingford, Nebr.

PROJECT: Construction of earthwork and structures from Station 0 / 00 to Station 555 / 00, laterals and sub-laterals, Mirage Flats project, Nebr. Site is 23 to 27 miles northeast of Hemingford, Nebraska. Earthwork includes clearing, grubbing; excavations for structures, channels and dikes; construction and compaction of embankments and backfills; dry rock paving. Structures include timber, concrete pipe, gates. Cement work includes mixing, forming, placing, finishing and curing.

CONDITIONS: Government to furnish cement, concrete pipe, gates, metal weir crests and gages, lumber for permanent installations, anchor bolts, bolts, washers, spikes, nails, paints and preservatives. Contractor to furnish all sand and coarse aggregates for concrete, all form materials, and the hauling of all materials, including those delivered to contractor by Government. Work to be completed in 180 calendar days. Wage rates specified by Secretary of Labor as minimums are: $1.25 to $1.50 for skilled labor per hour, 75¢ to $1.25 for semi-skilled and 70¢ for common. A 40-hour workweek is a requirement on site.

BIDS: Four bids were received at Hemingford, Nebr. on Oct. 19, 1945, ranging from the contract low of $81,362 to $162,655.

LIST OF BIDDERS:

1. Trione Contracting Co., Denver, Colo. $81,363
2. Malcolm G. Long, Billings, Mont. 85,713
3. Roush Construction Co., Crawford, Neb. 90,812
4. Steinwald and Watts, Denver, Colo. 162,655

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excavation for laterals	105,000 c. y.	$0.28	$0.30	$0.28
2. Overhaul	40,000 sta. c. y.	.02	.02	.02
3. Compacting embankment	5,000 c. y.	.30	.40	.50
4. Excavation for structures	5,000 c. y.	1.50	2.00	1.65
5. Backfill	3,000 c. y.	.40	.33	.35
6. Compacting backfill	1,600 c. y.	1.25	1.00	1.00
7. Dry rock paving	450 s. y.	4.00	5.00	5.50
8. Concrete in structures	615 c. y.	48.00	47.50	55.00
9. Placing reinforcement bars	50,000 lbs.	.05	.04	.06
10. Erecting timber in structures	13 Mbm.	75.00	75.00	100.00
11. Laying 18 in. dia. concrete pipe	650 l. f.	1.25	1.50	2.00
12. Laying 24 in. dia. concrete pipe	420 l. f.	1.75	2.00	2.60
13. Laying 30 in. dia. concrete pipe	360 l. f.	2.50	2.50	3.25
14. Laying 36 in. dia. concrete pipe	120 l. f.	3.50	3.00	3.75
15. Installing gates and misc. metalwork	13,000 lbs.	.10	.10	.20

BRIDGE, NEAR WHEATON, MINNESOTA

OWNER: Minnesota State Highway Department, St. Paul, Minn. E. J. Miller, bridge engineer.

PROJECT: 80 foot beam span bridge over the Mustinka River, one mile North of Wheaton, Traverse County, Minnesota. Concrete and steel rockers, concrete abutments, 30 foot roadway and concrete railings. Bridge No. 6459.

CONDITIONS: Contractor to furnish all materials and to complete work in 165 calendar days. (March 15, 1946) Rail and highway transportation facilities available to site of work. Wage rates stipulated are $1.10 to $1.40 for skilled labor; $.80 for semi-skilled, and $.60 for common labor per hour.

BIDS: Bids were received on September 28, 1945. Zantelli-Herbison, Inc., Ironton, made the only bid and the contract was awarded to them with a bid of $45,856.00.

Item	Quan.	Unit Price Bid	Amount
1. Class C excavation	1,000 c. y.	$0.65	$650.00
2. Class D.E. excavation	530 c. y.	1.00	530.00
2. Class W.E. excavation	440 c. y.	3.00	1,320.00
4. Sand-gravel fill in place	300 c. y.	1.00	300.00
5. Grade "A" concrete	590.6 c. y.	39.00	23,033.40
6. Grade "B" concrete	13.9 c. y.	50.00	695.00
7. Reinforcement bars	68,445 pds.	0.06	4,106.70
8. Structural metals	121,120 pds.	0.10	12,112.00
9. Name plates	2 ea.	10.00	20.00
10. 3-ply joint waterproofing	62 l. f.	0.80	49.60
11. Removal of old structure	Lump Sum	.....	3,000.00
12. Salvaged bit. mix. in place	40 c. y.	1.00	40.00

Construction of Check Structure
All-American Canal

OWNER: Bureau of Reclamation—All-American Canal System, Boulder Canyon project, J. K. Rohrer, construction engineer.

PROJECT: Construction of a check structure at Station 43 + 50 of the All-American Canal, Boulder Canyon project, Arizona-California-Nevada. Site is 12 miles north of Yuma, Ariz.

CONDITIONS: Owner to furnish majority of materials. Contractor shall haul and handle all materials on site; supply all form materials, riprap and backfill materials. All concrete placed under the supervision of a Government Inspector. Time for completion is 120 calendar days. Wage rates specified as minimums are: $1.25 to $1.87 for skilled labor per hour; $1.00 to $1.25 for semi-skilled, 95¢ for common.

BIDS: Eight bids were received at Yuma, Arizona on Oct. 15, 1945, ranging from the low of $271,005 to $497,572.

LIST OF BIDDERS:

1. Clyde W. Wood, Inc., Los Angeles, Calif. $271,005
2. Guerin Brothers, Los Angeles, Calif. 298,274
3. Fisher Contracting Co., Phoenix, Ariz. 302,360
4. Rhodes Brothers & Shofner, Los Angeles, Calif. 311,230
5. M. H. Hasler, Santa Ana, Calif. 343,175
6. Mittry Bros. Constr. Co., Los Angeles, Calif. 403,580
7. Ralph A. Bell & A. F. Heinze, Monrovia, Calif. 403,804
8. The Concrete Pipe Constructors, Los Angeles, Calif. 497,572

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excavation for bypass	175,000 c. y.	$0.25	$0.38	$0.50
2. Constructing dike embankments	10,000 c. y.	.20	.65	.95
3. Excavation for structures	12,400 c. y.	1.25	1.10	1.00
4. Compacted fill under structure	4,600 c. y.	1.50	1.20	2.50
5. Construction of reverse filter	110 c. y.	3.00	7.00	4.37
6. Backfill about structure	4,000 c. y.	.35	1.00	.75
7. Compacting backfill	2,400 c. y.	2.00	1.10	2.38
8. Removing dike embankments	10,000 c. y.	.30	.55	1.00
9. Backfill in bypass channel	175,000 c. y.	.20	.30	.25
10. Placing riprap 12 inches thick	500 c. y.	3.00	6.00	5.00
11. Placing riprap 24 inches thick with 6-inch gravel blanket	5,500 c. y.	3.00	4.50	4.25
12. Concrete in paving panels	970 c. y.	22.00	19.00	18.00
13. Concrete in structure except in paving panels	1,460 c. y.	50.00	32.00	32.00
14. Placing reinforcement bars	340,000 lbs.	.04	.03	.03
15. Placing asbestos-cement pipe	160 l. f.	1.50	3.00	1.60
16. Placing elastic joint-filler material	1,820 s. f.	1.50	1.50	.80
17. Placing rubber water stops	1,780 l. f.	.50	1.00	.65
18. Driving steel sheet piling	4,410 l. f.	1.00	2.90	1.50
19. Installing radial gates and hoists	148,000 lbs.	.15	.10	.09
20. Installing miscellaneous metalwork	7,000 lbs.	.20	.35	.18
21. Installing electrical metal conduit	700 l. f.	.50	2.00	.75
22. Installing electrical ground wires	50 lbs.	.50	5.00	1.00

SPEED TO SPARE!

ON LONG & SHORTER HAULS

One of a fleet of TERRA-COBRAS operating on a Trans-Pacific air base on the West Coast

Wooldridge Terra-Cobra self-propelled earthmovers consistently maintain speed up to 21 m.p.h. fully loaded. Positive two-wheel steering control eliminates the necessity of slowing down for rough travel, sharp turns, passing on narrow strips, or spreading on soft fills. Faster round trips from cut to the fill result in greater total yardages at a higher profit and lower yardage cost. *Investigate fully, today.* Write for complete Bulletin TA-425.

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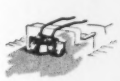
SCRAPERS
Tractor-drawn for handling heaping yardages from 6 to 28 cu. yards.



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Single and multiple drum with universal or roller fairleads.

★ **BULLDOZERS**
Tough and rugged design for standard makes of tractors.

★ **TRAILBUILDERS**
Adjustable angle-blades for standard tractor mounting.

★ **RIPPERS**
Available in light, medium and heavy duty models with two sizes to each model.

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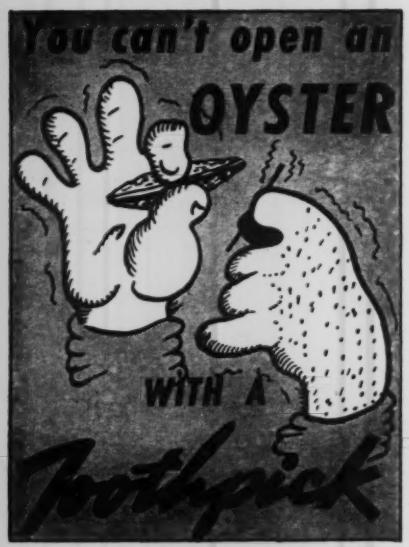

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WARRINGTON-VULCAN
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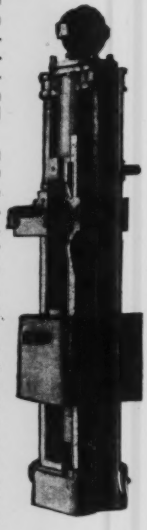
PILE HAMMERS

It takes positive action — the kind of action delivered by Warrington-Vulcan Single-Acting Steam Pile Hammers in putting down piles with speed and savings.

The Single-Acting Warrington-Vulcan drives any kind of pile —wood, steel or concrete. It delivers a moderate frequency of low velocity blows from a relatively heavy ram, operating at a medium steam pressure to get results, through rapid, regular and continuous action. Simple design and built-in ruggedness save maintenance, mechanical and operating costs. Its economy and ease of operation have been proved time after time on the tough jobs — ever since 1887.



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Since 1852
331 North Bell Avenue
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MEN AND JOBS

(*Continued from page* 44)

H. W. Tate has been promoted to assistant general manager of the Toronto, Ont., Transportation Commission, and **W. E. P. Duncan** has been promoted to chief engineer. Both are civil engineering graduates of the University of Toronto. Mr. Duncan will have charge of all track and building construction for Toronto's municipally-owned street railway system, and will also be in charge of the newly-formed rapid transit department of the commission investigating the proposed subway system.

Homer A. Hunter, assistant city manager of Dallas, Tex. has been made city manager of Lubbock, Tex. He served for 13 years as consulting engineer with the late John B. Hawley of Fort Worth and for two years as an engineer for the Fort Worth Housing Authority. In 1940, he became assistant director of public works at Dallas, later becoming superintendent of the Dallas water and sewage department, where he served until last July when he was made assistant city manager. He was graduated from Texas A. & M. College and received a civil engineering master's degree from the Massachusetts Institute of Technology.

Charles W. Oliver, Houston, Tex., construction man, who for 10 years has handled federal government construction projects in Texas, New Mexico and Arizona, has been made manager of the Houston branch of James Stewart Corp.

J. Burdette Morran is the new engineer of way for International Railway Co., Buffalo, N. Y., as successor to **Henry E. Riexinger,** who retired Nov. 1 after 35 years of service. Mr. Riexinger was assistant engineer for the Buffalo and Susquehanna Railroad before entering the employ of IRC in 1910 as field engineer. He had also been resident village engineer for Brockport and Lancaster, N. Y., during construction of their sewer systems.

J. H. Warner, senior engineer, U. S. Bureau of Reclamation, Denver, Colo., has retired after 22 years of service in the department of dams.

Lt. E. B. Gibbs, who prior to entering the Army three years ago was an engineer at Durham, N. C., for the North Caroilna Highway Department, has returned after 22 months service with the 848th Engineer Aviation Battalion in the China-Burma-India Theater. A native of Marion, N. C., he now is on a 60-day leave.

Stevenson & Young, Inc., contractors, New York City, have appointed **Wm. M. Merrick** vice-president. The company plans to establish an office at Short Hills, N. J. under the direction of Mr. Merrick. The company will offer its services in the engineering, planning and road construction field as well as in light and heavy construction work.

Lt. Col. John D. Faulkner, of Raleigh, N. C., who prior to entering the Army in August, 1942, was an engineer with the North Carolina State Health Department, returned recently following 20 months of service with the Supreme Headquarters of the Allied Expeditionary Forces in England, France and Germany. He was graduated from the North Carolina State College School of Engineering in 1935 and obtained his masters degree in public health engineering at the University of Minnesota in 1939. While overseas he served as chief of the administrative and personnel section of the Displaced Persons Branch, and as G-5 of the General Staff Division of SHAEF. He received the Bronze Star medal for "meritorious service." Following a 45-day leave, he reported at Camp Croft, S. C.

J. M. Dymond has been appointed director of Canada's Wartime Bureau of Technical Personnel, in Ottawa, succeeding **H. W. Lea** who has been appointed co-ordinator of public projects in the newly formed Department of Reconstruction of the Federal Government. Mr. Dymond is on loan to the Dominion Department of Labor from the Hydro Electric Power Commission of Ontario. He is a graduate civil engineer of the University of Toronto.

William Mayhew is with the Raymond Concrete Pile Co. as structural engineer on contract work in Monrovia, Liberia. He was formerly static test and analysis engineer with the Eastern Aircraft, Trenton, N. J., division, General Motors Corp. He is a graduate of the School of Technology, City College, New York, and has spent a year as junior engineer with the Panama Canal Commission and 9 months with the U.S.E.D. in Trinidad as associate engineer on bridges.

(*Continued on page* 88)

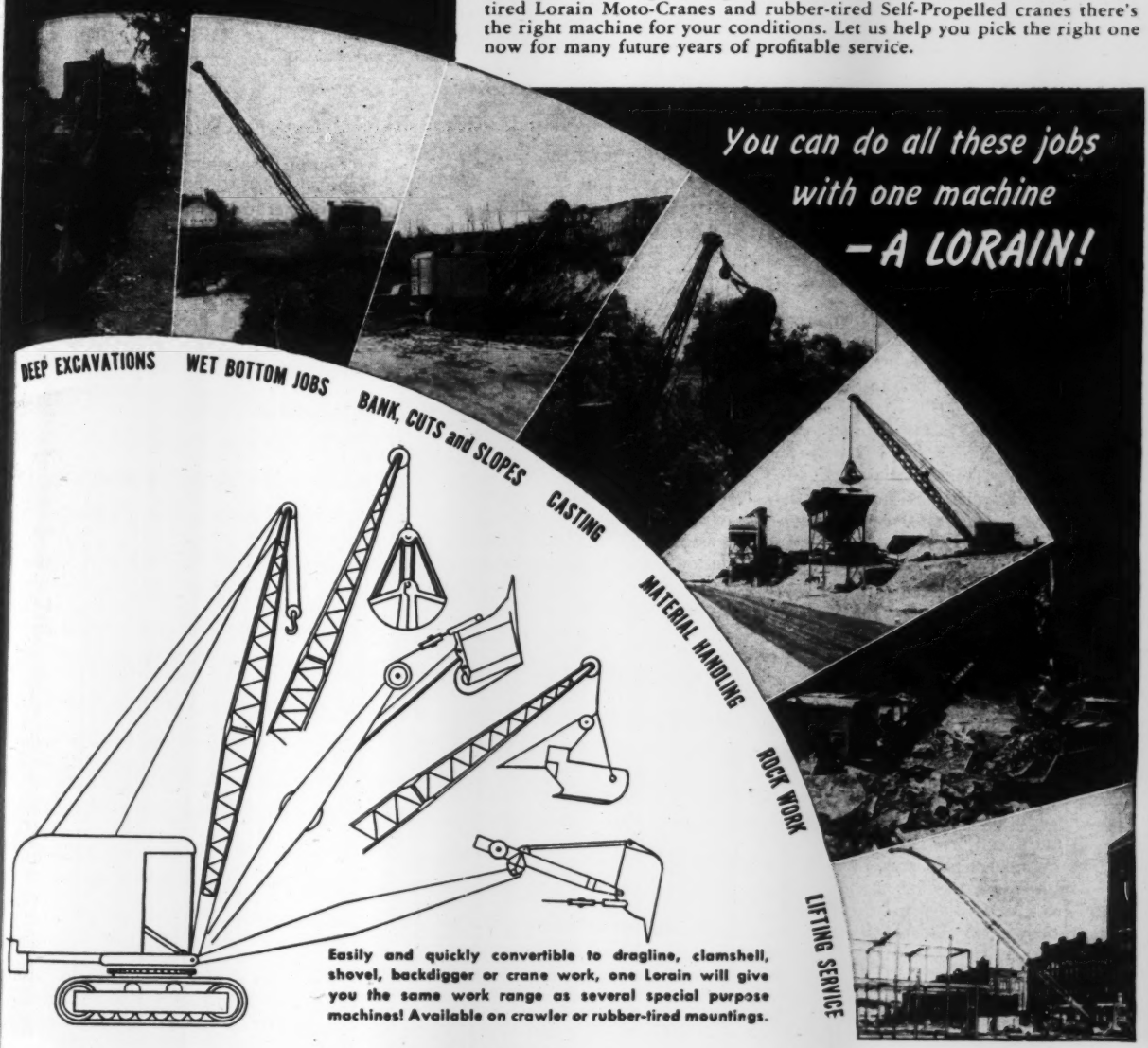
YOU'LL GET *MORE* OUT OF A *MULTI-PURPOSE* LORAIN!

CAREFUL job analysis shows that the vast majority of construction operations can be broken down into the seven basic work classifications shown below. Since no one can tell exactly which of these types of work—or combinations of them—your present or next contract will bring, the wisest investment is in equipment that can be adapted to every kind of work. And no other machines will fit into any and all classifications as well as multi-purpose Lorain Cranes and Shovels!

When you plan your next equipment purchase, look beyond the immediate job—consider the long range possibilities of what you buy. In stamina, in basic engineering and adaptability to every kind of work, Lorain Cranes and Shovels are designed to give you *years* of service on *all kinds* of jobs.

The five convertible and interchangeable front-ends shown actually give you five machines in one—an all-purpose outfit ready to cover the entire range of excavating, material handling and building jobs.

Ask your nearest Lorain distributor—or write us direct —for the facts and figures. Among the large and small crawler-mounted Lorains, rubber-tired Lorain Moto-Cranes and rubber-tired Self-Propelled cranes there's the right machine for your conditions. Let us help you pick the right one now for many future years of profitable service.



Easily and quickly convertible to dragline, clamshell, shovel, backdigger or crane work, one Lorain will give you the same work range as several special purpose machines! Available on crawler or rubber-tired mountings.

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THE THEW SHOVEL CO.
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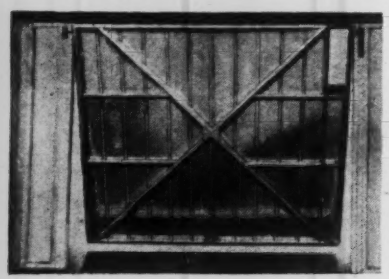
CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

New Aids to the Constructor

MANUFACTURERS' LATEST DEVELOPMENTS IN EQUIPMENT AND MATERIALS

Aluminum Overhead Door

Weighing less than 60 lb., a new all-aluminum reinforced overhead garage door is said to be strong, quickly installed and easily operated. All mechanism for its operation is installed in an 18-lb. metal box 6x6x24 in. high on the back of the door, which makes it possible to lower the roof line to the top of the door opening.



The door may be installed in an opening 8 ft. wide and 7 ft. high between jambs; multiple installations of 8-ft. doors may be made without breaker strips or posts.—*Berry Door Co., Birmingham, Mich.*

• • •

Universal Testing Machine

Tensile, traverse and compression tests up to 60,000 lb. may be performed by a new hydraulically operated machine, it is announced. Some of its features are: piston and cylinder lapped finish, carefully fitted without any packing; pulling head unit thrust taken on large steel ball and socket which allows head to float; load regulating valve to maintain uniform load rating.

The cylinder has a maximum stroke of 6 in. and the traverse table a maximum span of 30 in.—*Steel City Testing Laboratory, 8843 Livernois Ave., Detroit 4, Mich.*

• • •

Caulking Compound

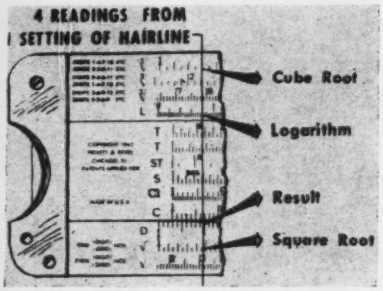
A compound for caulking, sealing and waterproofing window frames, defective masonry joints, etc., the new No. 2055 Dolfinite caulking compound has deep penetration. This product, remaining plastic underneath, forms a tough top film, over which paint or enamel may be applied without bleeding or discoloration. It is also said to be excellent for bedding glass in industrial plants, as it is unaffected by extremes of heat and cold, as well as moisture.

This material, which handles easily with a hand-caulking gun, is a standard gray, but special colors may be had on quantity orders.—*The Dolphin Paint & Varnish Co., 921 Champlain St., Toledo 3, Ohio.*

• • •

Decimal Point Locator

Now made of Dowmetal, which, it is claimed, is not affected by heat, cold or moisture, the Deci. Point slide rule has enduring accuracy. The metal core is surfaced with a flat white plastic, impervious to water, chemicals and abrasion, on which the scales are placed by special process to insure extreme accuracy and legibility.

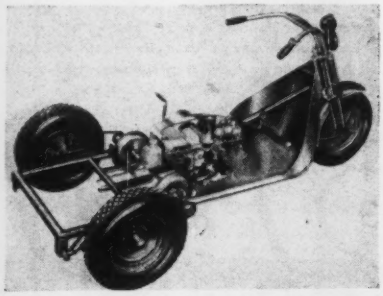


This rule will determine the precise location of the decimal point in involved expressions with results up to 19 places.—*Pickett & Eckel, 53 West Jackson Blvd., Chicago 4, Ill.*

• • •

Three-Wheeled Truck

Three years of research and experiment are behind the new Firebaugh Special, a three-wheeled truck which handles half-ton loads of 23 cu.ft. at up to 35 mph. Gasoline consumption experimental tests show 60 mi. per gal., it is claimed, and the motor is designed to use standard automobile parts.



Because of the fluid drive there are no gears to shift; speeds are governed by a foot throttle. This truck, weighing approximately 600 lb., has a low center of gravity and a turning radius of 14 ft.—*Toolcraft Mfg. Co., Huntington Park, Calif.*

• • •

Generator Load Control

Completely automatic, the newly developed Load Control for diesel-powered generating sets is said to effect savings in power costs and fuel consumption. This device requires no special wiring, and starts to operate on the flick of any lighting or appliance switch on an electrical circuit.

Load Control for single or three-phase generators is available exclusively on Sheppard diesel generating sets.—*R. H. Sheppard Co., Hanover, Pa.*

• • •

Metal Spray Gun

High spraying speed has been built into a new Mogul Model F metallizing gun, which is lightweight and streamlined and said to be very well balanced and smooth. The working parts of the gun are protected from dirt by fine mesh screen across the exhaust openings. There are a minimum number of parts, and no special tools are needed for assembly.

The Mogul gun is reported to spray, per hour, up to 14 lb. of steel, 40 lb. of zinc (actually 1,080 ft. of ⅛-in. zinc wire) and as much as 120 lb. of lead. It also has low gas consumption.—*Metallizing Co. of America, 1330 West Congress St., Chicago, Ill.*

• • •

Belt Hook

All types of flat belting up to ⅜ in. thick may be firmly joined with a new hinged-type wire belt hook. Because of a new method of mounting the hooks in the spacer card, the card may be left in place in the lacing machine; the hooks are thus held in accurate alignment until the hook points pierce the belt.

The hooks enter the belt in two rows with each opposite point passing into the belt in alternate rows.—*The Bristol Co., Mill Supply Division, Waterbury 91, Conn.*

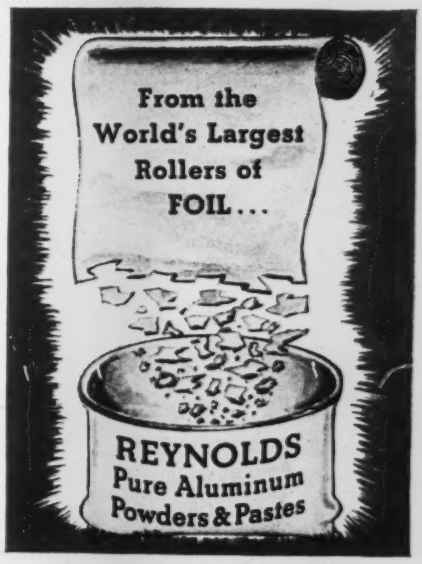
PROTECTS where corrosion's threat is greatest

It's more than paint . . .
It's LIQUID ALUMINUM

RAILROAD BRIDGES must "take it" day and night from punishing blasts of hot sulphurous acid smoke and steam. Aluminum coatings form a tough metallic shield that seals out moisture—resists corrosion—reduces bridge expansion and contraction—requires less maintenance.

Be sure to insist on aluminum coatings of standard quality made with Reynolds Aluminum Powders and Pastes, free from corrosion-forming impurities. These superior pigments are made from purest Reynolds aluminum foil stock...rolled...flaked...polished for maximum brilliance and reflectivity...quality-controlled every step of the way from mine to pigment and backed by a quarter-century's experience.

Write for complete information. Reynolds technicians will be glad to work with you. Reynolds Metals Company, Pigment Division, 19 East 47th Street, New York 17, New York.



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REYNOLDS METALS

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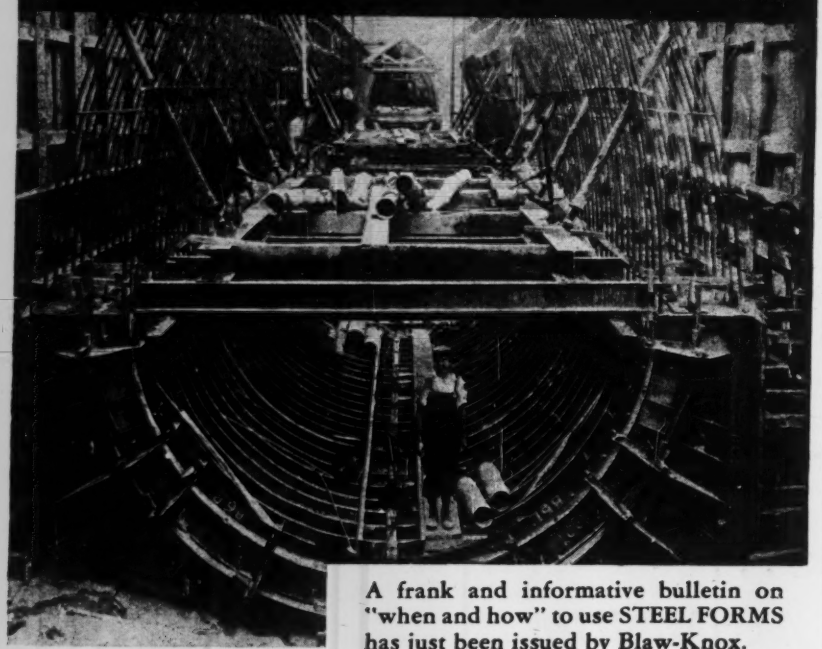
STEEL FORMS

will effect an **ULTIMATE SAVING**



A frank and informative bulletin on "when and how" to use STEEL FORMS has just been issued by Blaw-Knox.

PRACTICAL DESIGN SUGGESTIONS in this bulletin are a valuable guide to City, Municipal, Government and Consulting engineers.

LARGE SAVINGS may result by coordinating the concrete design with efficient forming methods, particularly where cross sections may change from station to station.

IT'S A GUIDE to proper forming methods. A copy of this bulletin—Blaw-Knox No. 2035—is yours for the asking.

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BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX CO.

2001 Farmers Bank Bldg., Pittsburgh 22, Pa.

MEN AND JOBS

(*Continued from page 84*)

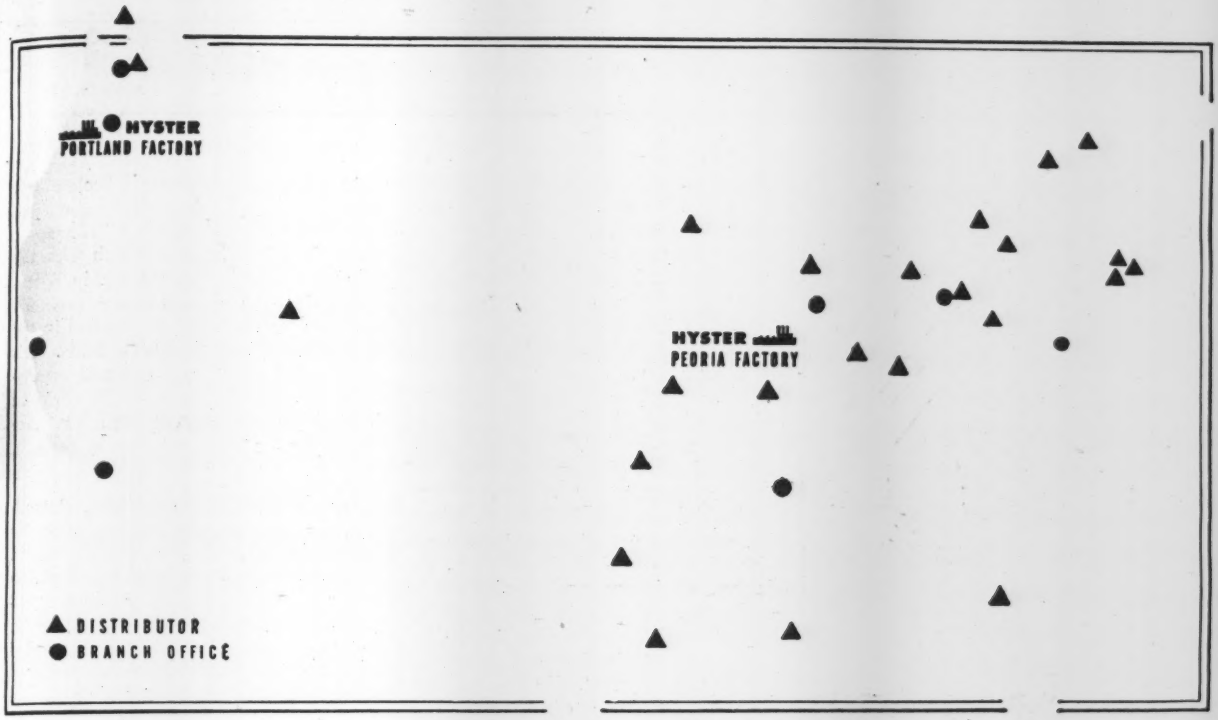
En route from China to Ft. Lewis, Wash., where he will receive further orders, **Col. James G. Truitt** recently visited the Seattle Army Engineer District office which he left in September, 1943. Colonel Truitt now holds the Legion of Merit and its Chinese equivalent, the Order of Cloud and Banner, for his work in locating the pioneer line of the Ledo-Burma Road. He was also commended by **Maj.-Gen. Lewis A. Pick** for his resourcefulness in constructing the remote Irrawaddy River Bridge ahead of schedule and under unfavorable supply conditions. Before going overseas Colonel Truitt directed a survey of the proopsed Trans-Canadian Alaska rail route from Prince George, B. C., to northern Alaska, a distance of more than 2,000 miles.

Walter R. Macatee has been appointed to the staff of the American Road Builders' Association as manager of the airport division. Among his connections have been special Washington representative for the Asphalt Institute, Edison Portland Cement Co., eleven years with the asphalt department of The Texas Co. and twelve years with the Asphalt Institute.

Herman T. Geiser, Bowling Green, Ohio, has been named building construction supervisor for the Ohio Welfare Department, and will act as a coordinator in the department's $23 million building program, in charge of all construction jobs. Geiser served as construction superintendent in the state architect's office for eight years.

Reuben K. Niece has been named engineering aide in the office of Union County, Ohio, Engineer Claude W. Skinmore, Marysville. Mr. Niece was recently employed by the Tennessee Valley Authority, working on large dams, access roads, and drainage channels.

N. F. Zurbuch, since August, 1943, manager of the Fort Wayne, Ind., district office of the late War Production Board, has opened a civil engineering firm in that city, known as Zurbuch, Inc., to specialize in industrial buildings, sewers and waterworks.



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LIFT TRUCK SERVICE COVERS THE COUNTRY

33 HYSTER DISTRIBUTORS AND FACTORY BRANCH OFFICES GIVE HYSTER OWNERS COAST-TO-COAST SERVICE...

HYSTER owners throughout industry have rapid service on genuine Hyster parts and on mechanical maintenance

Nation-wide parts and mechanical service is available through 2 Hyster factories, 8 Hyster branch offices and 23 Hyster distributors—a total of 33 centers.

This network of Hyster service facilities provides two important features:

1. **Strategically located supplies of genuine Hyster parts.**
2. **Factory-trained mechanics ready to render special service.**

Hyster lift trucks get around-the-clock use, meet both production and utility demands. When either parts replacements or service attention is required, both are quickly available. *Hyster's Service Department, like Hyster's Sales Department, covers the country.*

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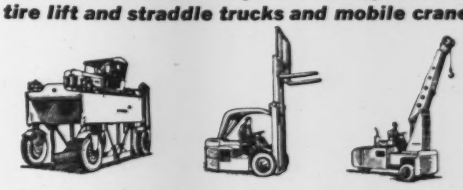
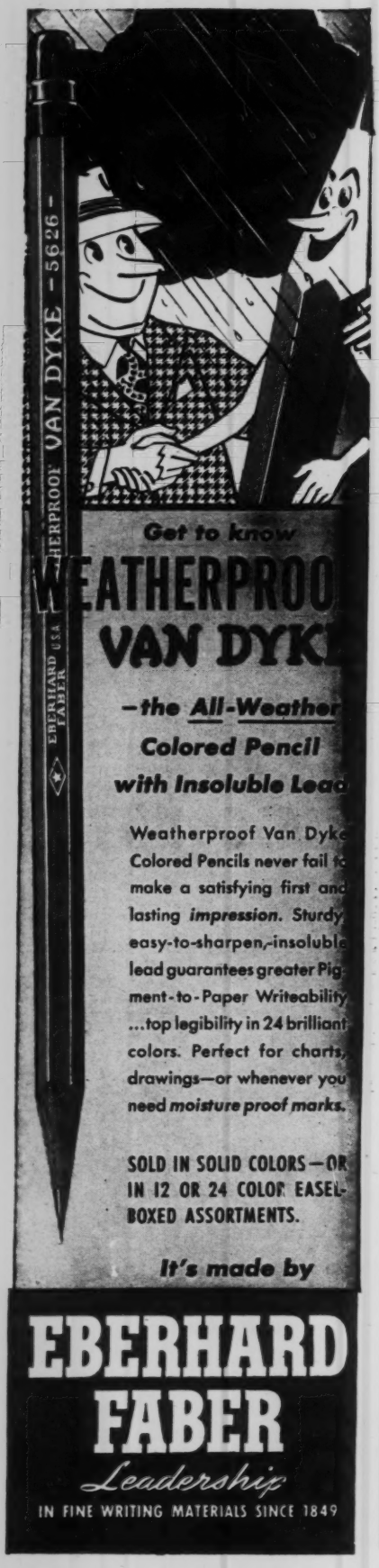
Manufacturers of a complete line of pneumatic tire lift and straddle trucks and mobile cranes

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Manufacturers' Activities

APPOINTMENT of W. E. Mullestein as manager of the Coatsville, Pa., district sales office of Lukens Steel Co. and subsidiaries, By-Products Steel Corp. and Lukenweld, Inc., has been announced by J. Frederic Wiese, vice-president in charge of combined sales of the companies.

Mullestein succeeds William C. Simpson, who was named recently as manager of sales of Lukenweld, Inc., designers, engineers and fabricators of weldments. Mullestein has been on leave from Lukens, serving in Europe with the Strategic Bombing Survey of the War Department. He is a civil engineering graduate of Cornell University. After three years with patent attorneys in New York City, he joined The Austin Co., New York and Cleveland, as field engineer and construction superintendent in the construction of industrial plants in the eastern United States.

From 1939 to 1942, he was associated with the American Iron & Steel Institute in New York, as a construction engineer and secretary of the committee on building codes. Early in 1942, he was given leave to join the War Production Board, Washington, D. C., where, in the Facilities Bureau, he was head industrial specialist, chief of the material and equipment branch, and director of the Progress and Scheduling Division.

THE MCGRATH MANUFACTURING CORP., Omaha, Neb., has purchased the six buildings in New Haven, Ind., formerly owned by the American Fork and Hoe Corp. There McGrath Corp. will manufacture tractor parts, bulldozer shields, hydraulic loaders, and hay sweeps. The principals are G. E. McGrath, Omaha, Neb.; H. A. McGrath, Fort Worth, Tex.; Clyde W. Reed and M. P. Torborg, Fort Wayne, Ind., and Arnold Gade, New Haven, Ind.

EDWARD M. BRICKETT, until a few months ago connected with Hume Pipe Co., of New England, Inc., for six years as general superintendent in charge of pipe and concrete products manufacture, recently joined the cement division of the Dewey and Almy Chemical Co. Mr. Brickett was graduated from Massachusetts Institute Technology, and received his master's degree from the University of Illinois. He spent some time in cement research with the Lehigh Portland Cement Co. in Allentown, Pa. Later experience included concrete design and field control in the construction and products fields. His new work will be research and promotion of products made by Dewey and Almy for the cement and concrete industries.

GAR WOOD INDUSTRIES, INC., Detroit, Mich., maker of truck and trailer equipment and producer of road machinery, has purchased Buckeye Traction Ditcher, Co., Findlay, Ohio, having acquired 92 per cent of its capital stock. Buckeye operations will be expanded and some products now manufactured by Gar Wood in Detroit will be shifted to Findlay.

SCHRAMM INC., manufacturers of portable and stationary compressors, announce the addition of the Standard Equipment and Supply Co., North Little Rock, Ark., as distributors. This firm will handle compressors and tools and have facilities for providing service and demonstrations.

FRANK A. SMYTHE, 77, only president of the Thew Shovel Co., Lorain, Ohio, since it was organized in 1898, and one of the leading industrialists of northern Ohio, died at Elyria recently. Mr. Smythe was born in Worcester, Mass., and in 1898 was graduated from the Massachusetts Institute of Technology. His son, C. B. Smythe, who had been vice-president for 25 years, has been elected president.

GUIDANCE MATERIAL for the use of men returning from the armed forces who are interested in civil engineering has been prepared by the National Roster of Scientific and Specialized Personnel. Included are a "Handbook of Descriptions of Specialized Fields in Civil Engineering" (Superintendent of Documents, Washington 25, D. C., 10c.); a description of the profession of civil engineering, in folder form; and "The Job of the Civil Engineer", Occupational Brief No. 16. Information concerning the two latter documents can be obtained from George A. Works, director of the National Roster, U. S. Employment Service, Department of Labor, Washington 25, D. C.

IT'S COZY INSIDE

That Mathews on the street-corner, standing guard by day and cold December night, knows no Winter inwardly. It may be deep-buried in snow and ice, but inside all is dry, all is well. For the low-placed orifice *drains all the water out*. Ice can't form. Mathews Hydrants have been the world's standard for over 60 years. Some of the other reasons: All working parts contained in a removable barrel, replaceable in a few minutes; service can't be interrupted long; the pavement need not be broken; head can be rotated 360°; can be raised or lowered as desired; opens *against*, closes *with* pressure; large water-carrying areas; cannot rust; greased or oiled from outside; all friction-points bronze-protected. Simple in design, rugged, trouble-free, Mathews Hydrants are giving 24-hour-a-day dependable service everywhere in the world. There are some 400,000 of them now, and, quite understandably, the number is rising fast.

MATHEWS HYDRANTS

Made by **R. D. WOOD** *Company*

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MANUFACTURERS OF SAND SPUN PIPE (CENTRIFUGALLY CAST IN SAND MOLDS) AND R. D. WOOD GATE VALVES

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TO ALL CONSTRUCTION SUPTS.:—

Have we been taking "BUCKETS" too much for granted? What about HAISS high power ratio 7:1
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GEORGE HAISS MANUFACTURING CO., INC., 140th ST. & RIDER AVE., NEW YORK 51, N. Y.

SQUARE A 12x12 in 10 Seconds

WITH A Mall CHAIN SAW

Mall Gasoline Engine Chain Saw. Available in Many Cutting Capacities.

Heavy timbers and piling used in the construction of bridges, docks, trestles and large industrial buildings can be squared to size in a few seconds with a Mall Gasoline Engine Chain Saw. Use this simple-to-operate power saw right on the job—it is easy to handle and readily portable. Has stall-proof clutch, handle throttle and automatic oiling system. Cutting chain swivels for horizontal, vertical or any angle cut. Pneumatic and Electric models are available. Also Electric Chain Sharpeners.

Write for name of nearest Distributor. Demonstrations can be arranged.

MALL TOOL COMPANY, 7730 South Chicago Ave., Chicago 19, Ill.

Mall PORTABLE POWER TOOLS

Elections and Activities

Officers have been elected for the Illinois Sewage Treatment Works Operation as follows: L. H. Freeman, superintendent of the sewage treatment plant, Geneva, chairman; Clifford Fore, superintendent of water and sewage, Carbondale, vice chairman; and Walter M. Kunsch, engineer-manager, Urbana-Champaign Sanitary District, secretary.

For the northern section, officers chosen were: F. E. Johnson, superintendent, Elgin Sanitary District, chairman; Clarence Hill, superintendent, Dixon sewage treatment plant, secretary.

L. W. Hunt, superintendent, Galesburg Sanitary District, will serve as chairman for the central section, assisted by George L. Hall, superintendent of the Bloomington-Normal Sanitary District sewage treatment works, vice chairman, and by Dr. W. D. Hatfield, superintendent of the Decatur Sanitary District, secretary.

Southern section chairman is Clifford Fore, superintendent of water and sewage; vice chairman, Ray Schmidt, superintendent, Millstadt; and secretary, Frank Kuhl, superintendent of utilities, Breese.

Formation of a council of technical and engineering groups with a membership of more than 3,000 in the Akron, Ohio, district has been started. A committee headed by T. C. Dee is at work on the organization plans. Other officers of the committee are Wendell R. LaDue, vice chairman, and D. W. Hayes, secretary.

Dee represents the National Society of Professional Engineers; LaDue, city water department head, is from the American Society of Civil Engineers, and Hayes, of Goodyear Tire & Rubber Co., the American Institute of Chemical Engineers.

Members of the committee in addition to the officers, include: M. L. Davis, city service director, and L. J. Hoffman of the city water department, of the National Society of Professional Engineers; B. S. Garvey of B. F. Goodrich Co. and G. E. P. Smith of Firestone Tire & Rubber Co.

S. B. Morgan of La Grande, Ore., has been reelected president of the Oregon Association of County Engineers. New officers are P. M. Morse of Eugene, vice president, and Paul B. Rynning of Medford, secretary-treasurer.

Manufacturers' Publications

Floating Derrick — An interesting booklet, with text and photographs, describes the "Paul Bunyan," the gigantic floating derrick built under the direction of the U. S. Army Engineers to be used in installing or repairing the lock gates at Sault Ste. Marie, Mich. It can handle a load of 312 tons.—*Wiley Equipment Co., Port Deposit, Md.*

Piping Layouts—The flexibility analysis of a pipe layout—subject to thermal elongation—determines pipe line movements caused by expansion, as well as the anchoring forces, with the resulting stress. A scientifically designed system, including functional spring hangers and vibration eliminators, permits the installation of most economically shaped structures that allow free flexure of entire piping systems in all planes. This is explained in an illustrated booklet.—*Blaw-Knox Co., 525 Pennsylvania Ave., N. S., Pittsburgh 12, Pa.*

Electrical Insulating Materials—This is a treatise and catalog combined. The treatise is on dielectrics, and the catalog is on electrical insulating materials.—*William Brand & Co., 276 Fourth Ave., New York 10, N. Y.*

Material and Construction Manual—This booklet is full of helpful facts and suggestions pertaining to materials and construction methods for tanks, towers, pumps, floors and other masonry construction. It describes corrosion-resistant masonry.—*The U. S. Stoneware Co., Akron 9, Ohio.*

Precision Products—A company that started 50 years ago making pumps has since made many different precision products. Its golden anniversary booklet tells especially about its automatic centrifugal pumps and bronze plumbing fixtures.—*Barnes Manufacturing Co., Mansfield, Ohio.*

Timber Connectors — A 20-page booklet, freely illustrated, cites 72 railroads which employ a system of timber construction. Separate chapters discuss the split ring, spike grid, clamping plate, shear plate, toothed ring, claw plate and their railroad applications, interior railroad structures and buildings.—*Timber Engineering Co., 1319 Eighteenth St. N. W., Washington, D. C.*

Used either for primary or auxiliary heat, Reznor Unit Heaters are ideal in heating all sizes and shapes of industrial buildings, retail stores, garages, airports, churches, bowling alleys. In fact, they are used the world over to heat all sizes of areas, large or small.

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You need *no labor* for firing. Dependable Reznors operate automatically and supply heat when you want it where you want it.

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No heat loss due to transmission. Reznor Heaters fire directly to the area. The giant size, noiseless fan delivers an even flow of clean, comfortable heat.

Reznor, the oldest name in gas heating equipment, makes a full range of sizes of gas-fired unit heaters. Fuel cost is the *only* operating cost. *You save three ways when you use Reznor Unit Heaters.*

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"GAS HEATERS EXCLUSIVELY SINCE 1888"

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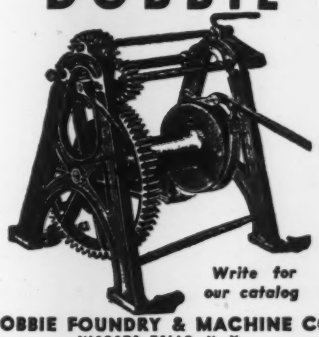

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DENSE · DURABLE · HIGH STRENGTH
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Restoring Disintegrated Concrete
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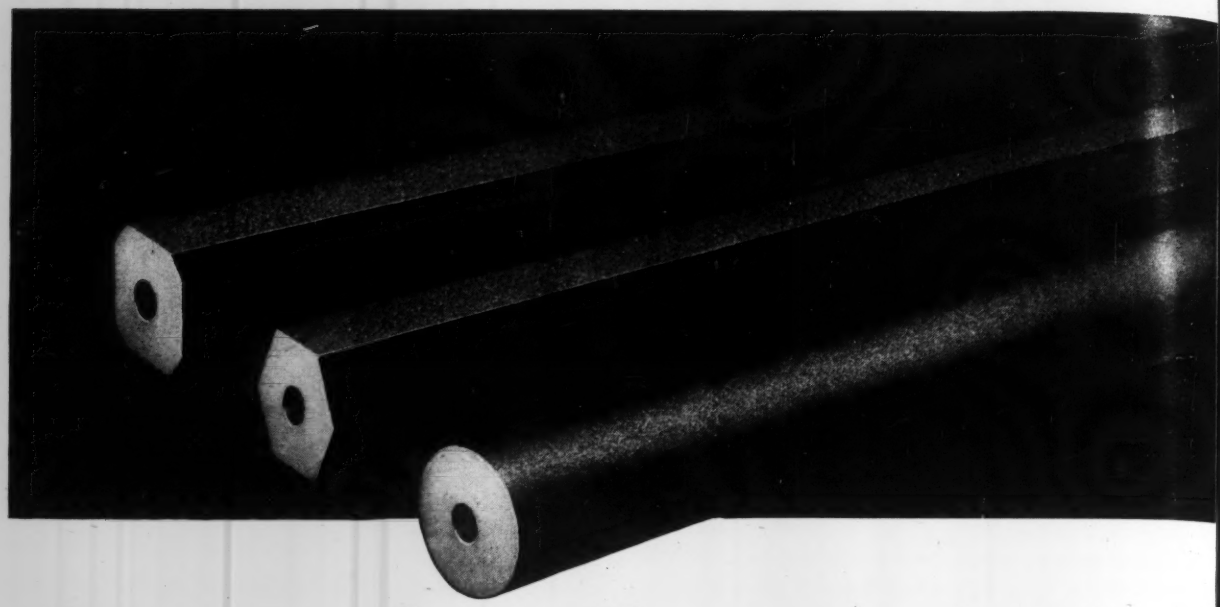
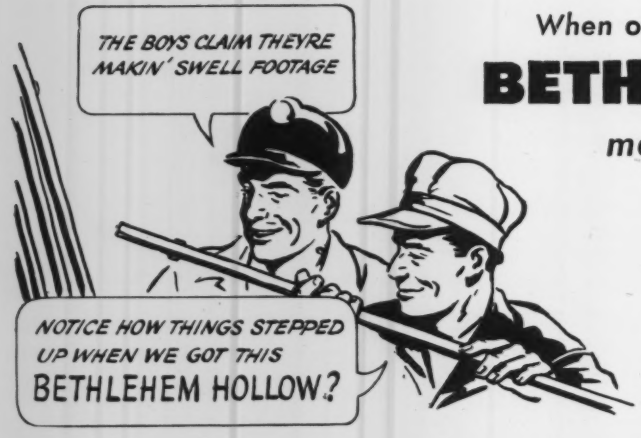


Your rock drills can't do it all

You can own the finest drills ever made, but you won't get maximum results unless your drill steel is right.

When you carefully invest your dollars in good rock drills, be equally careful that you get Bethlehem Hollow Drill Steel. After all, the steel's the thing that actually does the cutting. When Bethlehem Hollow is working for you, there is no question of its ability to absorb hard knocks and *keep drilling*, even through the most quarrelsome rock.

In the blacksmith shop, you'll find that Bethlehem Hollow makes up readily, and doesn't get "fussy" in the heat-treating stage. This is because of its wide quenching range. You'll find, too, that the hole is always round, smooth, well centered; that the steel works equally well whether you thread it for detachable bits or forge on your own bits.



When ordering drill steel, always remember:

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makes a good drill better

★ BETHLEHEM STEEL ★

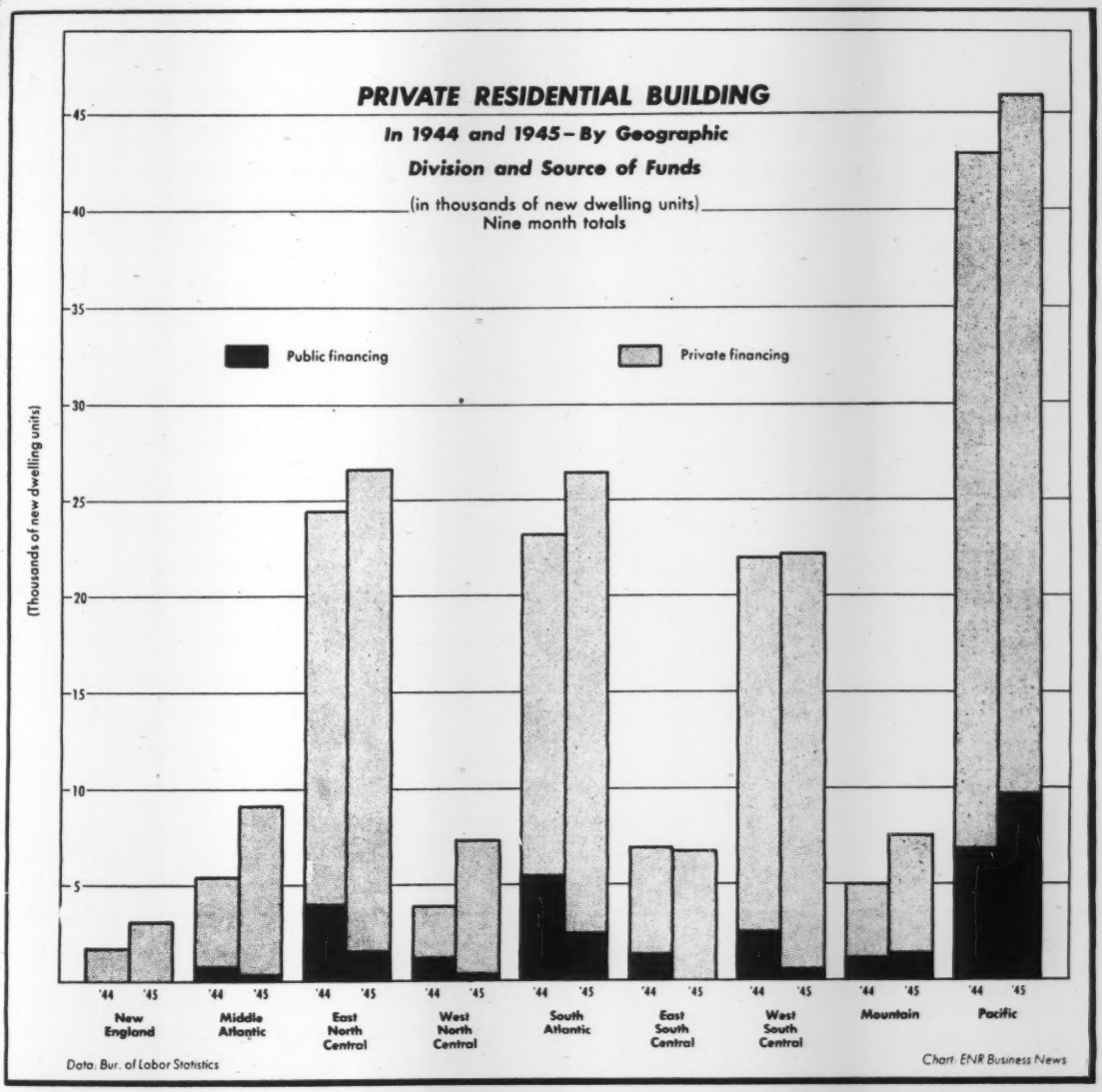
Construction Trends

Private Residential Building Increases Over 1944

THE END OF THE THIRD QUARTER of 1945 recorded the anticipated rise in private residential building in all nonfarm areas of the United States. According to Bureau of Labor statistics, the 154,900 new nonfarm dwelling units started in the first nine months of 1945 represents a 14 percent increase over the 135,800 units started in the like period of 1944.

All regions recorded gains in the nine-month period of 1945 over 1944 except East South Central states which show a decrease due to a drop in Federal work.

The 154,900 new dwelling units under construction during the nine-month period of 1945 is less than 30 percent of the units started in a like period of 1941 and but 20 percent of the 1925 peak.



ENGINEERING NEWS-RECORD. Published every Thursday. **Return postage guaranteed.** Vol. 135, No. 26. **Price 25c per copy. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, 99-129 N. Broadway, Albany 1, N. Y., or 330 W. 42nd Street, New York 18, N. Y. Subscriptions, United States, U. S. Possessions and Latin American Republics, $5.00 for one year, $8.00 for two years, $10.00 for three years. Canada $6.00 for one year, $10.00 for two years, $12.00 for three years. All other countries, $10.00 for one year. $20.00 for three years. Please indicate position and company connection on all subscription orders. Entered as second-class matter October 29, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in the U.S.A. Cable Address: "McGrawhill New York." Member A.B.P. Member A.B.C.** Copyright 1945 by McGraw-Hill Publishing Company, Inc. All rights reserved. James H. McGraw, Founder and Honorary Chairman; JAMES H. McGRAW, JR., President; CURTIS W. McGRAW, Senior Vice-President and Treasurer. HOWARD EHRLICH, Vice-President (for business operations); WILLARD CHEVALIER, Vice-President (for editorial operations); JOSEPH A. GERARDI, Secretary, and J. E. BLACKBURN, JR., Vice-President (for circulation operations). **Publication office: 99-129 North Broadway, Albany 1, N. Y. Editorial and Executive Office: 330 West 42nd St., New York 18.** District Managers and Branch Offices: Fred G. Hudson, 520 N. Michigan Ave., Chicago 11; 738-9 Oliver Building, Pittsburgh; J. W. Otterson, 68 Post St., San Francisco, 4; Aldwych House, Aldwych, London, W. C. 2, England; Washington; J. M. Spackman, New York; A. V. Cozzens, Philadelphia; E. E. Duff, Jr., Cleveland; B. F. Horn, Detroit and Chicago; W. G. Payne, St. Louis; R. N. Phelan, Los Angeles; J. I. Ballard, Boston; Ralph Maultsby, Atlanta, Ga.

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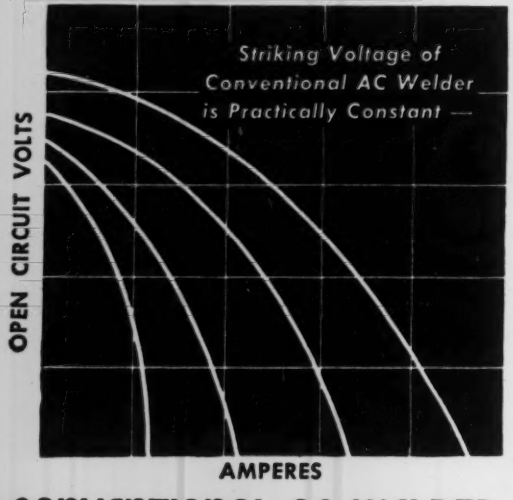
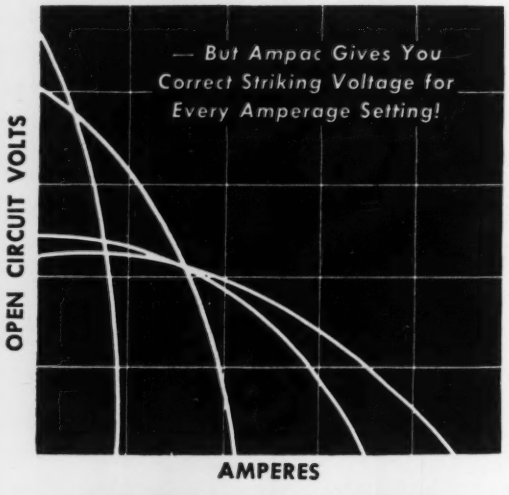
Magic Arc Control

with Power-Saving, Easy-to-Strike Arc



CONVENTIONAL AC WELDER

Arc welding at low current settings requires increased voltage for striking the arc. That's an established fact. But greatest welding economy demands a *minimum* striking voltage at *high* current settings. Note that conventional a-c welders offer only a compromise—with practically *uniform* striking voltage at all current settings.



AMPAC AC WELDER

Only Ampac—through exclusive, patented circuit —automatically provides correct voltage for *every* amperage setting. On low current settings Ampac *steps up* striking voltage to make welding easier! On high current settings Ampac saves power, reduces spatter, by *cutting down* excess striking voltage. It's exclusive . . . *Magic Arc Control!*

CHECK AMPAC'S COMPLETE STORY

Get full details on economical, time-saving Ampac a-c welders from our nearby welder dealer or district office. Or write ALLIS-CHALMERS, Milwaukee 1, Wis. Also inquire about A-C's complete line of welding electrodes and accessories. A 1935

ALLIS-CHALMERS

HEAR THE BOSTON SYMPHONY: *Every Saturday Evening, American Broadcasting Co.*

LET'S GET ACQUAINTED!

Do you *know* the Northwest line of Shovels, Cranes, Draglines, Pullshovels, and rubber tired equipment? From the big 2½ yd. capacity model 80 Shovel down to the 3/8 yd. model 15, there is a Northwest for every material handling and excavating problem.

Have you ever asked about Northwest advantages—advantages and design that lift Northwest out of the class of ordinary machines built with price in mind—Northwest simplicity, the "Feather-Touch" Clutch Control, the Cushion Clutch, Uniform Pressure Swing Clutches, the Dual Independent Crowd, Northwest differential steering and other features that speed up operation, cut costs and increase capacity. These advantages along with proved dependability are the reasons why year after year, one out of every three Northwests sold is a repeat order.

Let's get acquainted.

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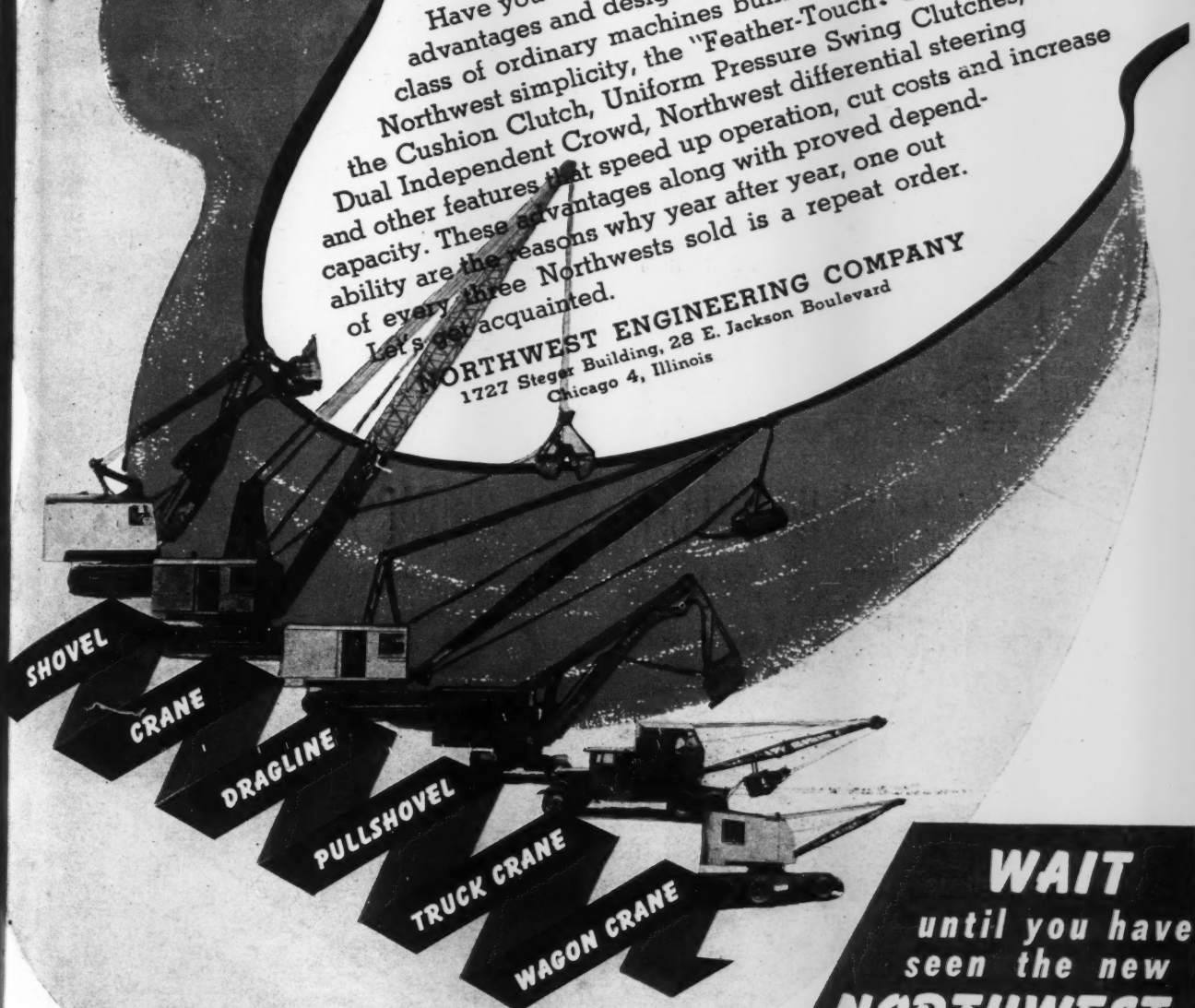

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WAIT until you have seen the new **NORTHWEST** Rubber Tired Line of Truck Cranes Truck Shovels or Wagon Cranes Before You Buy!

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There IS a Reason
Gar Wood—World's Largest Manufacturer of Truck and Trailer equipment—earned this leadership through ability to engineer and build units of such outstanding performance that men who know equipment best specify Gar Wood.
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Other Products: • TANKS • HEATING EQUIPMENT • MOTOR BOATS

TOUGH, WILLING and ABLE!

IF high-speed operations have been causing quick failure in your air hose and increasing maintenance costs—sound practice is to standardize on Goodyear **Redwing H Cord Air Hose.**

Here's an air carrier that's tough, willing and able to stand the gaff of the most punishing air hose jobs. Redwing has always been tops in quality — and now it's even better than it ever was before.

Redwing H Cord Air Hose is doing yeoman duty in shipyards, steel mills, mines, quarries, heavy industries of all kinds. Everywhere it's in use, it is giving an outstanding account of itself, smoothing the flow of production and keeping maintenance costs and need for replacement at the minimum. Try it yourself — and you'll soon learn why users are so enthusiastic about this heavy-duty hose.

Made in continuous lengths, in seven sizes up to 1½" diameter. Order from the G.T.M. — Goodyear Technical Man — or phone your nearest Goodyear Industrial Rubber Products Distributor.

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Redwing H Cord Air Hose
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A — Highest quality synthetic rubber tube, nonporous, impermeable to oil
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FOR HOSE, BELTING, MOLDED GOODS, PACKING AND OTHER INDUSTRIAL RUBBER PRODUCTS built to the world's highest standard, phone your nearest GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR.
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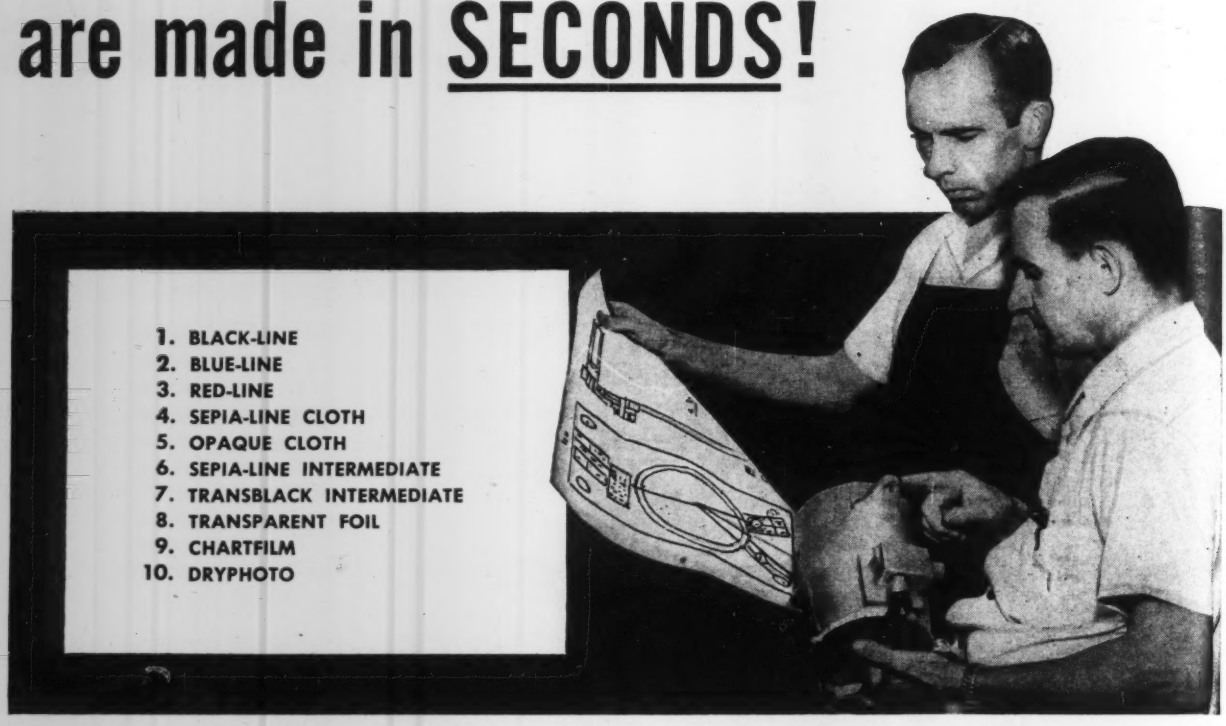
ALL 10 TYPES OF OZALID PRINTS are made in SECONDS!



YOU ORDER the type of Ozalid print best suited for the job at hand . . . whenever you want a reproduction of an engineering drawing, specification sheet, typed report, or other original. Each type of print has its advantages!

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EACH PRINT is a positive—not a negative—reproduction of the original. Easier to read and check! Identifying colors may be assigned to prints of different departments...and prints made on paper, cloth, foil, or film to suit job conditions. Ozalid Chartfilm, for example, is oilproof, waterproof. Can be cleaned with a damp rag.

ROUTINE WITH OZALID—impossible with any other printmaking process: 1. Continuous tone prints of photographic subjects; 2. Transparent film prints which can be overlaid to show separate details; 3. "Intermediate" prints which simplify design changes; 4. Ten types of prints instead of 1, which save time, labor, and materials.

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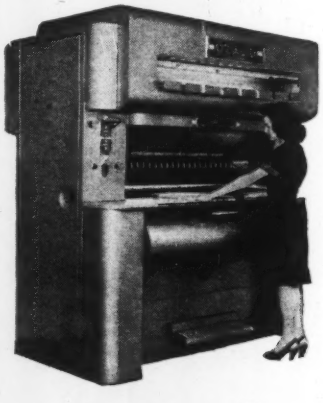

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WE'VE GOT TO DO MORE THAN TALK ...AND QUICK!

Almost everybody today agrees that an adequate highway program is absolutely essential to a sound post-war economy. In fact, Congress has already voiced its approval by providing three billion dollars of federal funds.

Yet despite all the talk, the job of turning plans into blueprints is still far behind schedule!

Your state, your county has a tremendous responsibility in this important task. For unless adequate construction plans are completed and readied for bids immediately, it will be impossible to provide enough jobs to support the millions of returning service men and workers being released from war plants.

So unless we want "another WPA," it's up to all of us—engineers, public officials, contractors, distributors and manufacturers—to exert every possible effort to speed the completion of local plans, and to support competitive bidding as the one best way to build the kind of roads America needs at lowest possible cost to the Taxpayer. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; San Leandro, California.

LACK OF PLANS JEOPARDIZING HIGHWAY PROGRAM

by Charles M. Upham—Engineer-Director
American Road Builders' Association

"With the need great and with funds available, we might well imagine all state and local highway departments busy as beavers turning out blueprints, writing specifications and doing all those engineering tasks which must be done before contracts can be let and the actual work started. Unhappily this is not the case. Only eight states have sufficient plans ready to make an adequate start; and this lethargy and delay may jeopardize the entire post-war program. It is a matter that concerns every reader of this publication for the condition of the nation's highways affects all of us, no matter where we live or what we do. The answer is to appeal to those charged with preparing plans to get busy immediately."

FOR REAL ECONOMY IN EARTHMOVING BETTER SEE THE NEW LPC'S

High-Speed Scrapers

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Proved...

As No Other Rotary Snow Plow Has Been Proved!

• There are more Snogos in service than any other make of rotary plow. Behind Snogo is 18 years of service in the hands of highway departments, municipalities and airports. Repeat orders from state and county highway departments and cities of all sizes offer an array of testimonials to length of service and quality performance that can't be equalled.

A rotary plow is an operating piece of mechanism not to be compared with a blade hung on the front of a truck and depending on the brute force of the truck for action. It's as dead as a dodo if it doesn't operate.

After a blizzard when miles of highway are snowed under and drifted over is no time to experiment with somebody's untried machinery. Then is when you want a proved machine you can depend on—a Snogo. There is a Snogo for every budget from a 1-½ ton truck to the largest four wheel drive type of truck. Ask for details.

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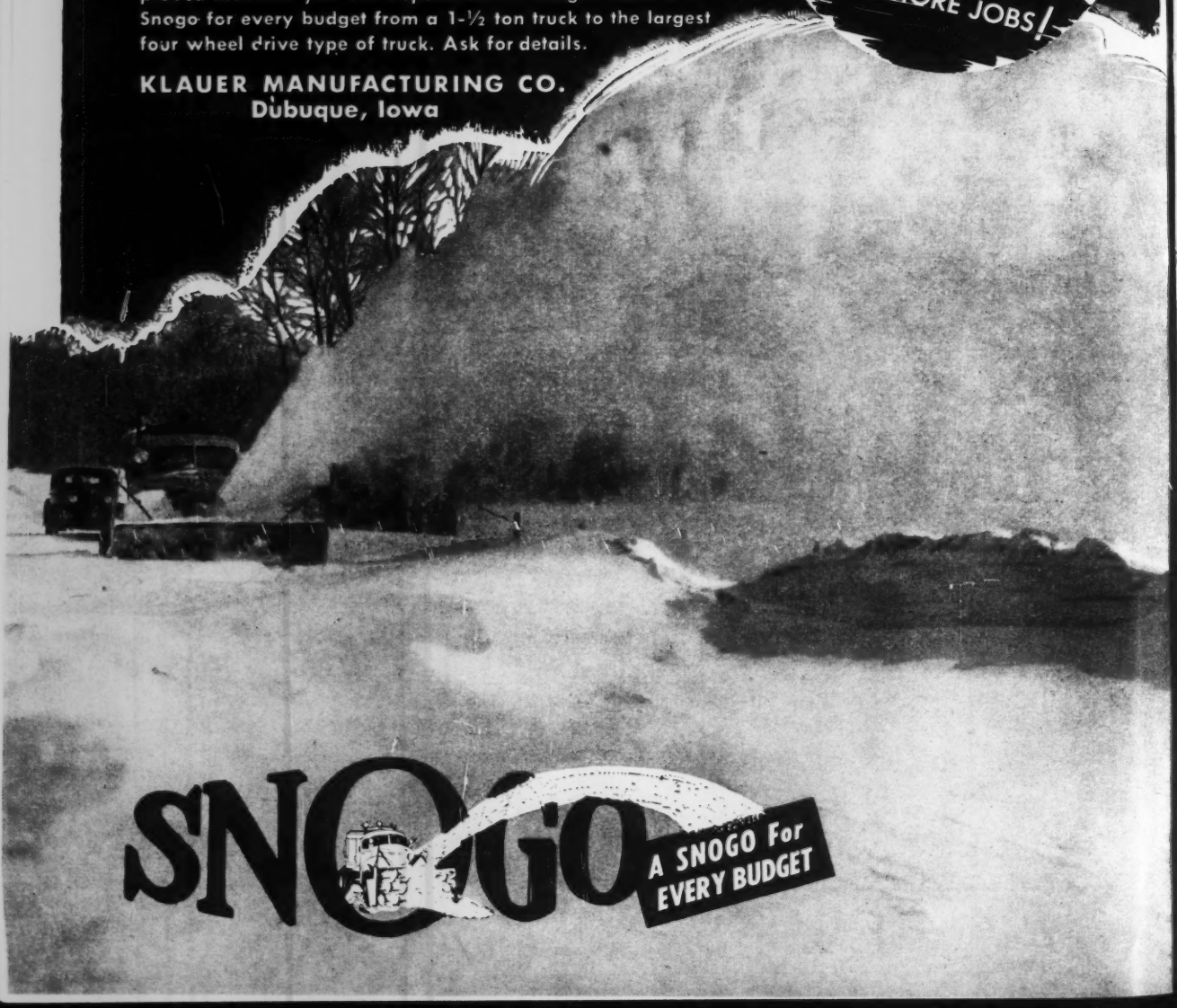

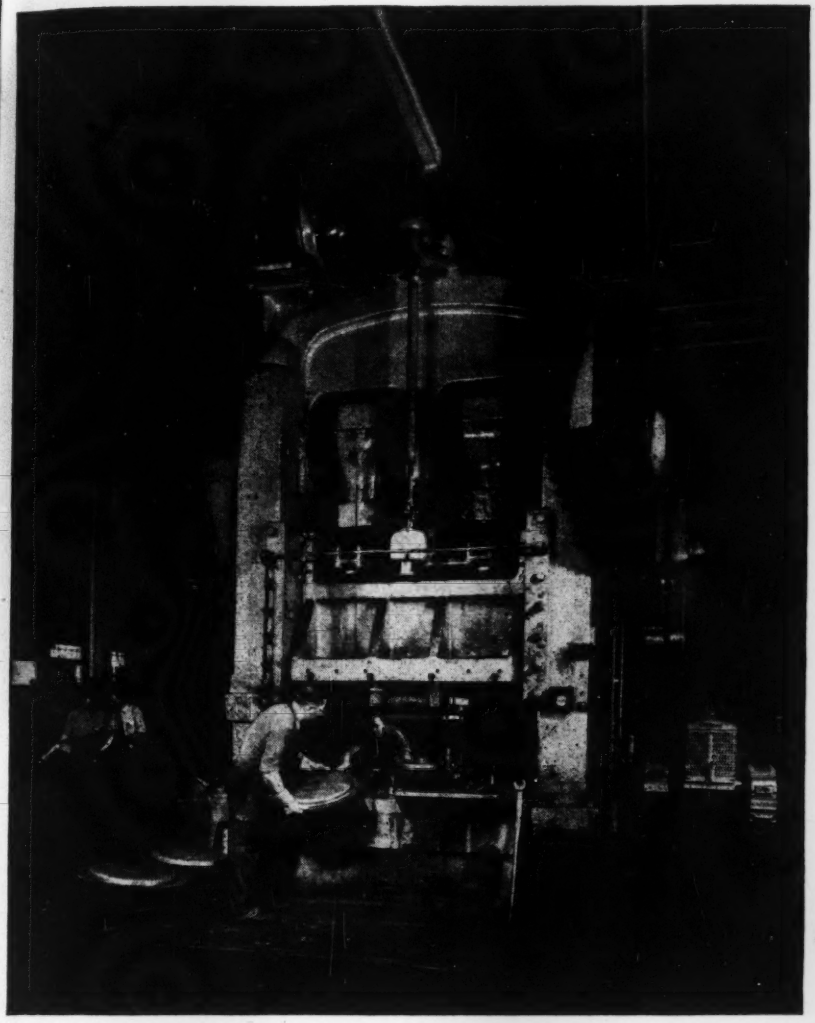

Forming rear wheel discs on a 450-ton press in the Oliver "Cletrac" plant.

This is a pressing matter!

In this huge 450-ton press, many heavy precision parts are formed for Oliver "Cletrac" crawler tractors. Like clockwork, a part is formed every few seconds . . . another example of the modern production methods and equipment that permit Oliver "Cletrac" to build in added quality at no extra cost to the user.

Quality is the keynote that characterizes every Oliver "Cletrac" crawler tractor . . . in design, workmanship, materials and performance . . . quality that means years of dependable, economical service.

Maintenance of this standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors . . . for your every need.

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THE OLIVER CORPORATION Cletrac

You'll Build Better, Faster, More Profitably with SKILSAW because

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saves time, man power, material handling!

• In spite of much talk about high building costs, SkilSaws savings on every cut in construction enable you to bid lower on every job . . . handle more jobs, easily . . . make more profit on each one. Ask your distributor to demonstrate SkilSaw's speed, economy and dependability today!

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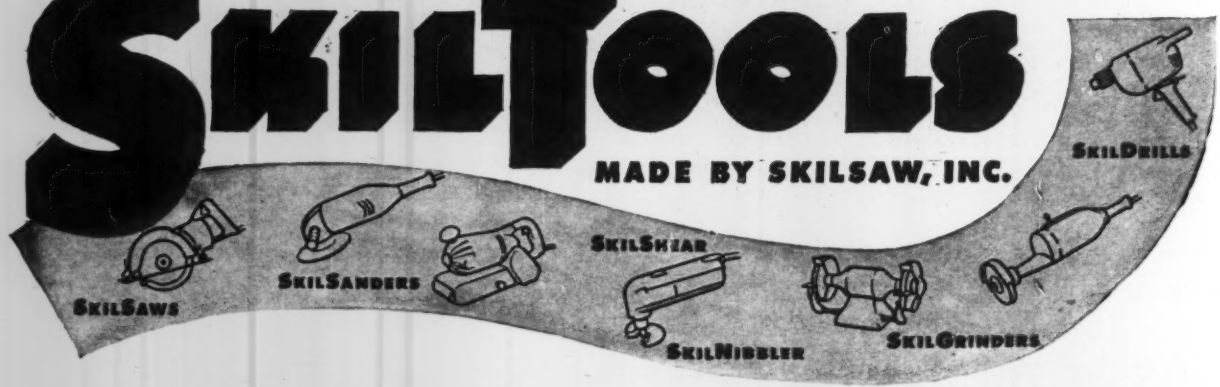


Plastics

MUST BE TAILOR-MADE

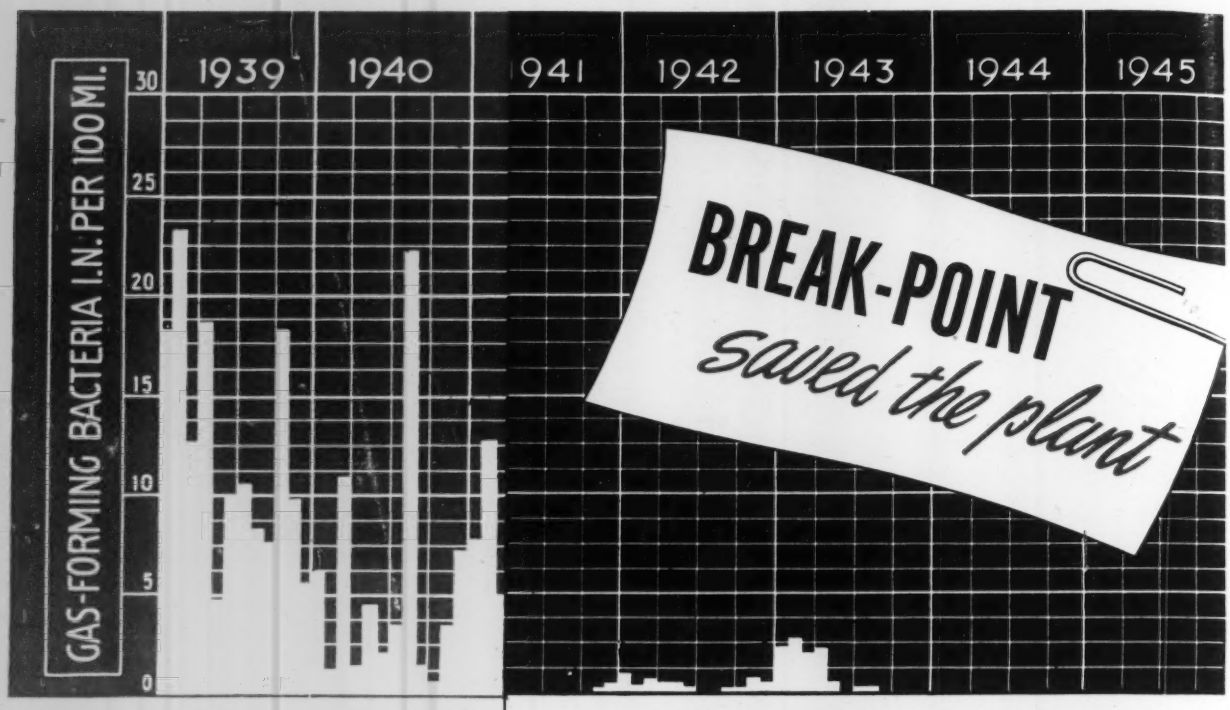
Because plastics have such a wide appeal, many people have come to think of them as a cure-all for every type of application. This is a misconception.

Plastic insulation, like rubber, must be compounded to meet the specific problems of the job in hand. Maximum and minimum temperatures, vibration, presence of certain oils, acids, alkalies, and other factors, all must be taken into consideration.

Simplex-PLASTEX insulated wires and cables are all engineered for the job they are to do. When you need plastic insulated wire and cable, come to the headquarters for advanced research both in raw materials and manufacturing technique, — come to Simplex.

Simplex—WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.



Enables city to use existing source

Just a few years ago the modern, half-million dollar filtration plant for the water supply of a small city seemed doomed to abandonment. With the methods employed, the bacterial content of the finished water could not be properly controlled. Break-Point Chlorination was then adopted . . . with the remarkable results shown above.

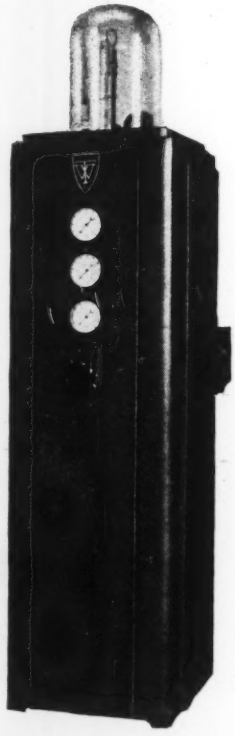
The water now meets exceptionally high bacteriological standards and tastes and odors have been reduced . . . with a substantial reduction in overall chemical costs.

This progressive plant is one of many where the maintenance of *free available chlorine residuals*, by chlorinating beyond the break-point, provides extra safety.

Safer, more palatable water, may be one of the civic improvements your citizens will expect soon. To be ready, check now with your W&T Representative on what Break-Point Chlorination can do for you.

BACTERIOLOGICAL DATA

	BEFORE B-P CHLOR.	AFTER B-P CHLOR.	CHANGE
Total Bact. per ml (avg.)			
Raw	225.	307.	+36.0%
Filtered	10.8	0.3	−97.2%
Finished	0.90	0.57	−36.6%
I. N. (Indicated Number) Gas-forming Organisms per 100 ml			
Raw	1769.3	2554.8	+44.3%
Settled	10.418	0.591	−94.3%
Filtered	0.697	0.047	−93.2%

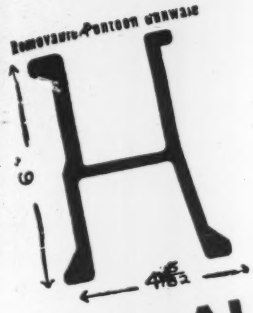


SA-192

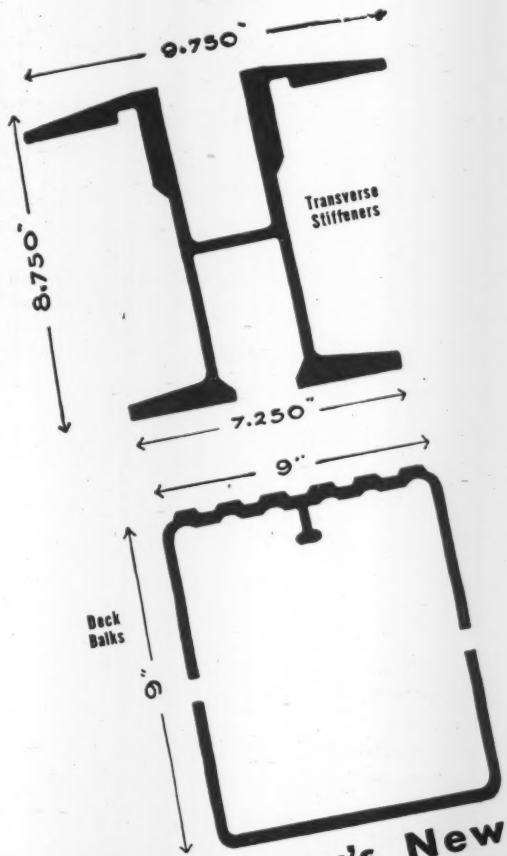
"THE ONLY SAFE WATER IS A STERILIZED WATER"

WALLACE & TIERNAN COMPANY, INC.

MANUFACTURERS OF CHLORINE AND AMMONIA CONTROL APPARATUS
NEWARK 1, NEW JERSEY. REPRESENTED IN PRINCIPAL CITIES



ALCOA EXTRUDED SHAPES



'Constructed largely of aluminum extruded shapes and sheet—from pontoon skids to bridge deck—this new bridge goes into place fast and carries heavy loads.

Alcoa Aluminum extruded shapes speed the manufacture of bridge and pontoon boat parts. Metal is distributed as you see it here, to suit strength and structural requirements. In many cases, parts are ready for assembly as extruded.

The light weight makes handling of the boats and bridge members easy. A 15-foot deck balk, for example, weighs only 215 pounds; can be carried by four men. Laid side by side, but staggered to distribute the load, these balks form a continuous beam of roadway. ALUMINUM COMPANY OF AMERICA, 2108 Gulf Building, Pittsburgh 19, Penna.

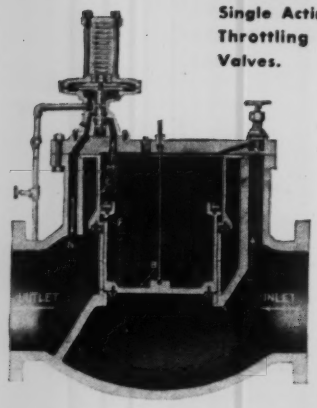
In The Army's New Aluminum Floating Bridge

The M-4 floating bridge was developed by the Corps of Engineers, Army Service Forces. It is capable of carrying a 50-ton vehicular load across currents as swift as ten feet per second. A 300-foot section can be in service in less than two hours.

ALCOA

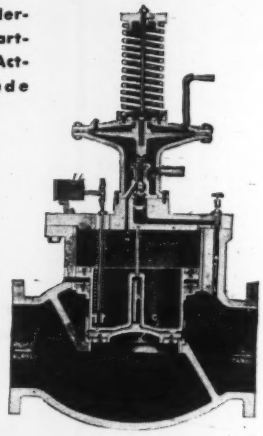
ALCOA ALUMINUM

Golden-Anderson Single Acting Semi-Throttling Altitude Valves.



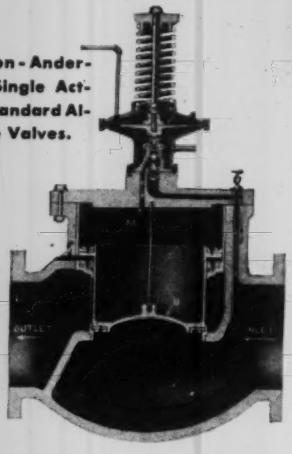
For New Construction or Rehabilitation

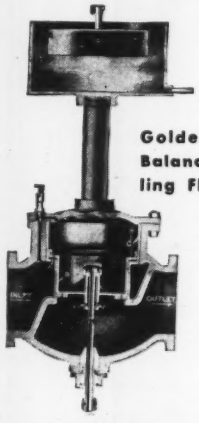
Golden-Anderson Stop Starter Single Acting Altitude Valves.



STANDARDIZE ON GOLDEN-ANDERSON VALVES for Engineered Protection

Golden-Anderson Single Acting Standard Altitude Valves.





Golden-Anderson Balanced Controlling Float Valves.

A dependable source for your most Important Valve Requirements

Golden-Anderson Altitude Control Valves require no floats or complicated fixtures in their installation. They can be easily installed and protected from inclement weather to assure unfailing water service control under any climatic conditions. Sensitive operation is another outstanding feature—they faithfully maintain water levels within 3" to 12" variation and may be arranged with auxiliary equipment to perform a multiplicity of services. Write for latest technical catalog.

Let Golden-Anderson Engineers aid in your Planning

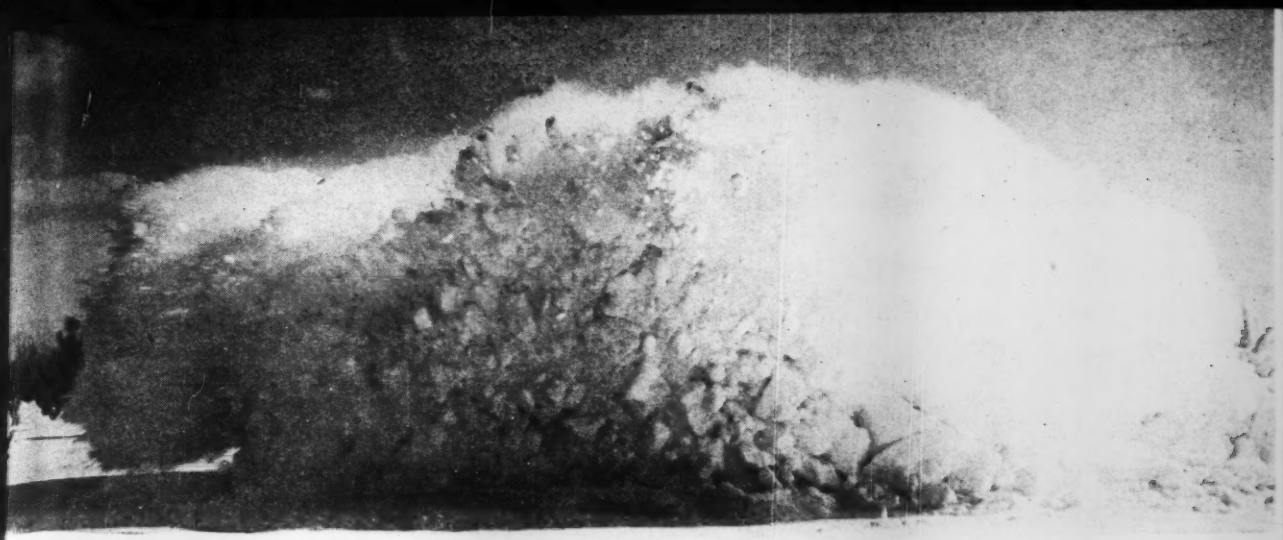
Our engineers are available to aid in the successful solution of any difficult valve problem.

write for descriptive technical catalog

GA

GOLDEN-ANDERSON VALVE Specialty Company

FULTON BUILDING • PITTSBURGH 22, PA.



FWD *Snow-Bank Busting* POWER
CONQUERS HEAVIEST DRIFTS

● FWDs are the snow-clearing trucks that can bust in and break the worst snow banks — clean them up fast, economically! Sure-footed traction and power on all four wheels make FWDs the No. 1 snow removal and road maintainance trucks of the nation. Thousands of these rugged, heavy-duty trucks, equipped with many different types of snow plows, will deliver the knockout punch to snow in every state in the snowbelt this year, and remove the menace of snowbound highways, streets, airports and other areas where snow must be put out of the way

When Spring comes, these same rugged snow-fighting trucks will have their plows removed, to change over to the many other tough road jobs which only four-wheel-drive power and traction can match. One truck for ALL jobs, ALL seasons . . . that's the FWD!

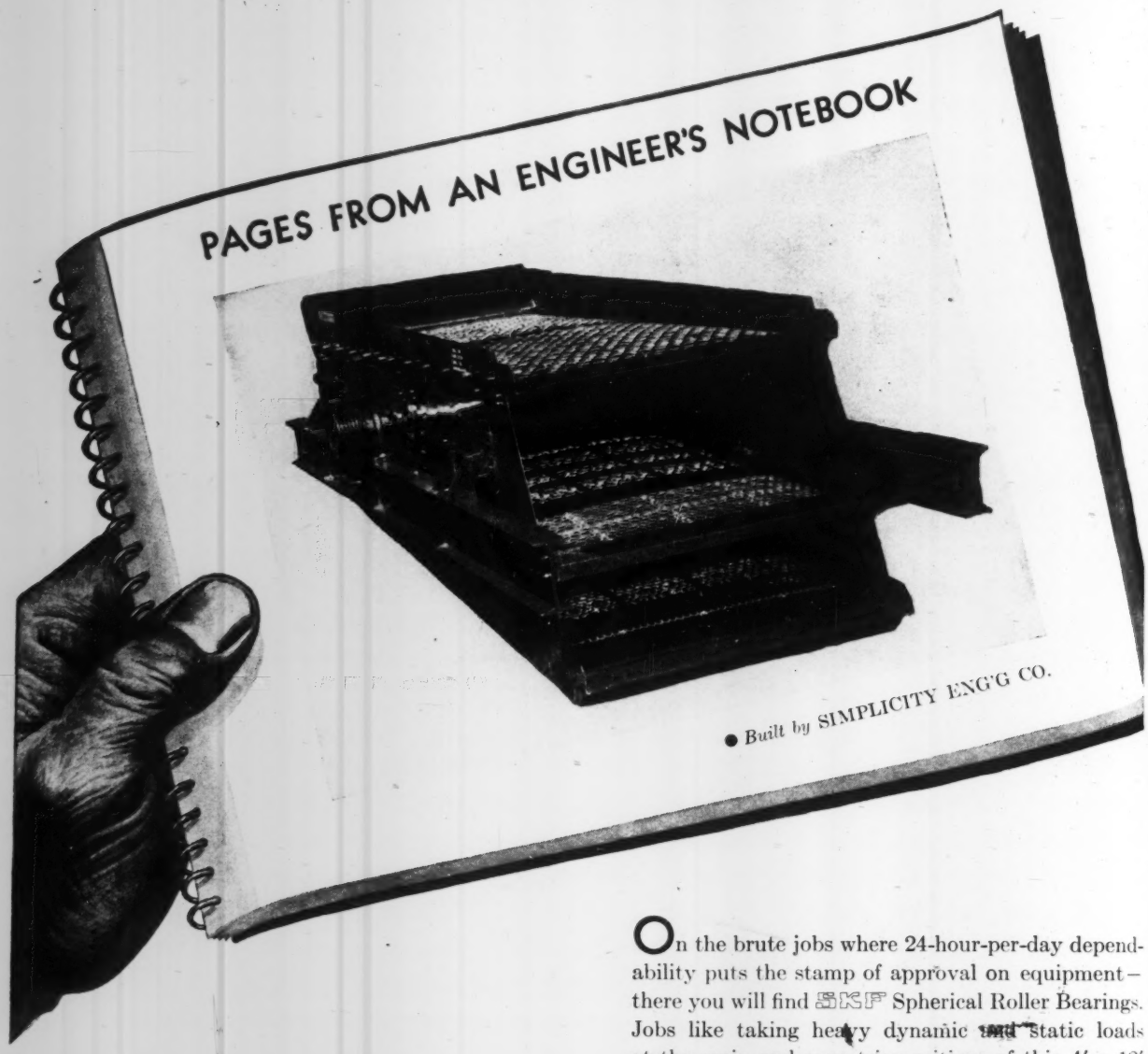
THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wis.

Canadian Factory: KITCHENER, ONTARIO

THE ORIGINAL EXCLUSIVE BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS

THE ONE TRUCK FOR MANY JOBS

SPRING — Road conditioning and construction.
SUMMER — Earth-moving. Material hauling.
FALL — Road patrolling. Snow fence hauling.
WINTER — Snow clearing.



EASILY HANDLING 2000 TONS OF ROCK PER DAY!

On the brute jobs where 24-hour-per-day dependability puts the stamp of approval on equipment—there you will find SKF Spherical Roller Bearings. Jobs like taking heavy dynamic and static loads at the main and eccentric positions of this 4′ x 12′ Triple Deck Vibrating Screen that handles 2000 tons per day of 18″ and under rock. Rugged SKF Bearings take it, *like* it, and come back for more. Their high load carrying capacity is always available for useful work because they have rolling alignment. In exchange for occasional lubrication, they assure a long productive life. Another outstanding example of putting the right SKF in the right place. 5921

SKF INDUSTRIES, INC., PHILA. 34, PA.

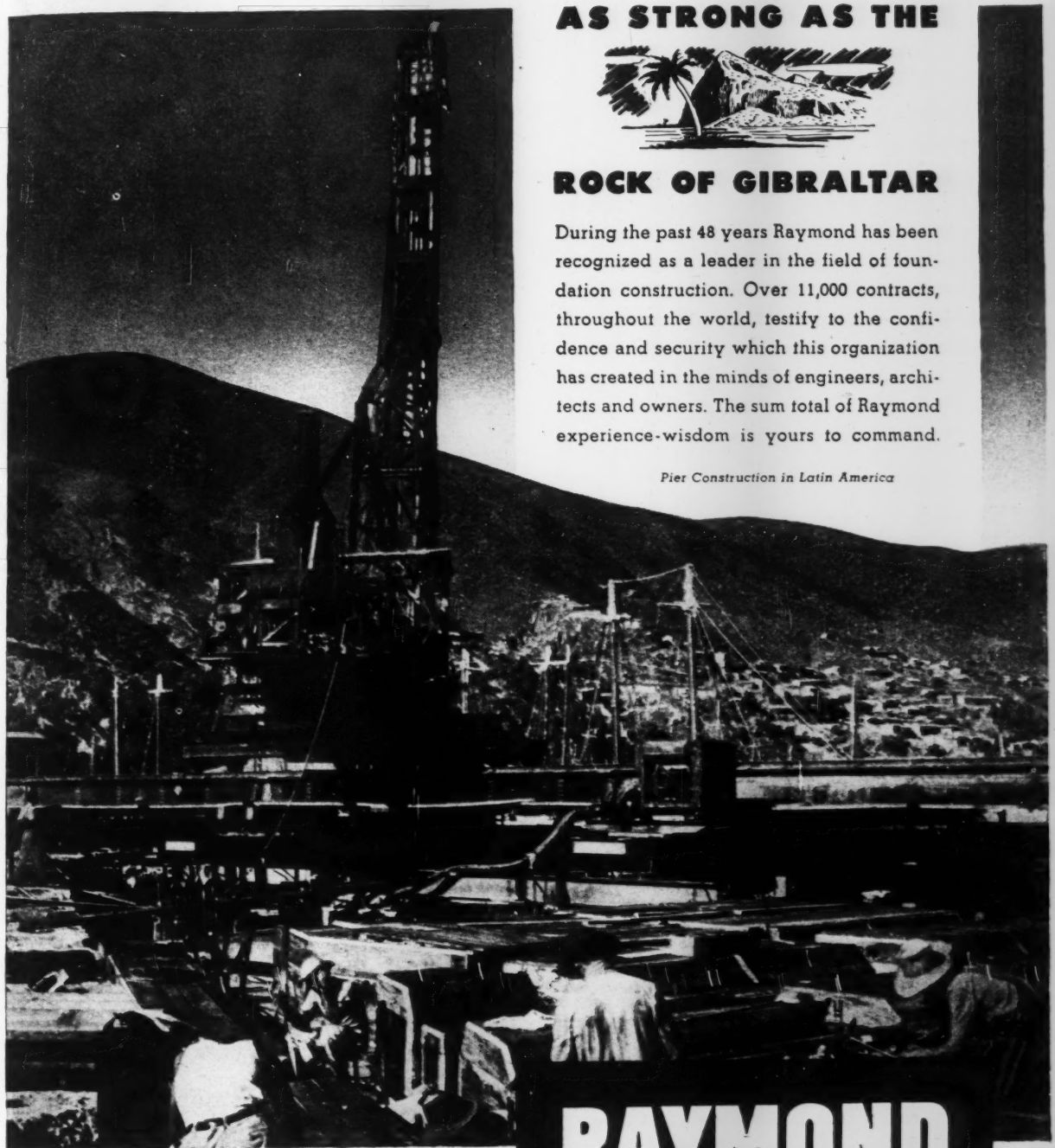
FOUNDATIONS

AS STRONG AS THE

ROCK OF GIBRALTAR

During the past 48 years Raymond has been recognized as a leader in the field of foundation construction. Over 11,000 contracts, throughout the world, testify to the confidence and security which this organization has created in the minds of engineers, architects and owners. The sum total of Raymond experience-wisdom is yours to command.

Pier Construction in Latin America



RAYMOND
CONCRETE PILE CO.

INQUIRIES INVITED ON SMALL AND LARGE JOBS

THE SCOPE OF RAYMOND'S ACTIVITIES includes every recognized type of pile foundation—concrete, composite, precast, steel, pipe and wood. Also caissons, construction involving shore protection, ship building facilities, harbor and river improvements and borings for soil investigation.

Public Benefits will be Great in the NATION'S HIGHWAY PROGRAM

A large proportion of the nation's highways throughout the nation are scheduled for improvement in the next few years. This means an era of better, safer driving.

So tremendous a job is one for experts, capable of directing the work with the maximum economy, efficiency, speed and consideration for the needs and convenience of the public.

Highway officials, engineers and contractors have the experience, the technical knowledge and the determination to handle the work most effectively. Moreover, in carrying out this great modernization program, they know that it is essential to minimize delays and inconvenience to the public, which will be driving more than ever after so many restrictive years. A.G.C. contractors have an important place in this program. They can be depended upon to serve faithfully and well, because of the business principles for which the A.G.C. emblem stands.

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA · REG. U.S. PAT. OFF. · A G C · SKILL · INTEGRITY · RESPONSIBILITY

This advertisement is No. 4 of this series

THE ASSOCIATED GENERAL CONTRACTORS *of* AMERICA, INC.

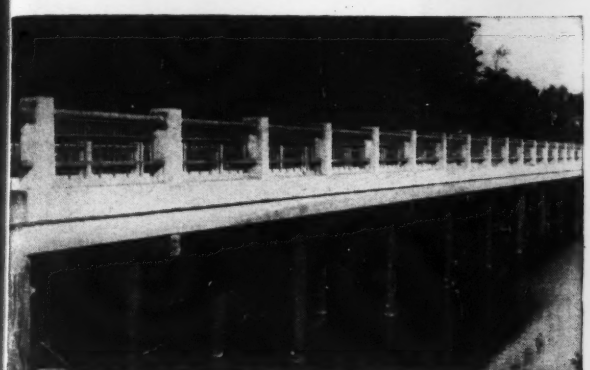
Ninety Branches and Chapters Throughout America

National Headquarters — Munsey Building, Washington 4, D. C.

SKILL, INTEGRITY AND RESPONSIBILITY IN CONSTRUCTION OF BUILDINGS, HIGHWAYS, RAILROADS, AIRPORTS AND PUBLIC WORKS

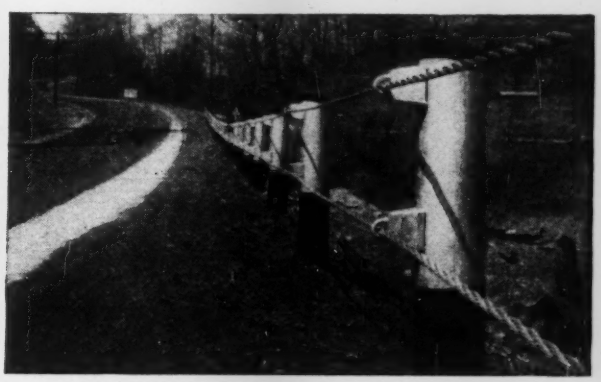
Balance your highway program by surfacing with TARMAC

A balanced program calls for proper maintenance of existing roads and selection of the proper types of new construction. Many types of highway work can be done better with Tarmac than with any other material. Send for a copy of the booklet, "Surfacing with Tarmac."



This photo shows how beautiful a bridge can be

This is a composite deck bridge with a laminated base made up of pressure-creosoted timber plank, alternate pieces being raised to form longitudinal grooves. Small steel shear developers set in the wood integrate the wood base and the concrete top into a single beam. The concrete mat does double duty as part of the supporting medium and as a durable traffic surface. A mesh of round steel bars reinforces the concrete mat. Full latitude for architectural treatment is possible, as this bridge indicates.



Pressure-treated guard posts and rails resist decay

Timber is a stronger and more adaptable material for highway posts than most other materials. Properly pressure treated with creosote, it is at least as permanent as other materials used for highway posts and requires less maintenance. Salts-treated rails can be painted for greater visibility.

Buy Victory Bonds . . . and keep them!

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNA.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

KOPPERS COMPANY, INC., PITTSBURGH 19, PA.

Send for these Koppers booklets:

- ☐ Surfacing with Tarmac
- ☐ Pressure-treated Highway Posts
- ☐ Painting Creosoted Wood
- ☐ Typical Highway Bridges of Pressure-treated Timber

Name..... Street.....

City..... State.....

For the security of your FABRICATED STRUCTURES...

use dependable

Oliver Bolts, Nuts, Rivets

Available in a complete range of sizes and types, Oliver Construction Fasteners are accurately made, dependable, uniform. Various steels and alloys, heat treatments and protective coatings provide fasteners for a wide range of services. Extensive experience in the design and manufacture of headed and threaded products gives Oliver the ability to furnish fasteners that meet your most exacting requirements.

OLIVER
IRON AND STEEL
Corporation

South Tenth and Muriel Streets • Pittsburgh 3, Pa.

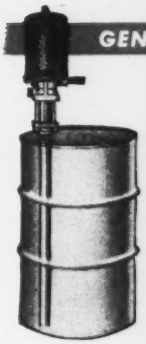
New Alemite Lubrication Equipment to Keep Old Machines Rarin' to Go!

The stage is set for a revival of civilian construction—and all signs point to a boom! But, until you can get all the new machines you want, many old ones will have to do. That's why it's tremendously important to keep them in shape with proper, positive lubrication. And genuine Alemite Lubrication equipment will help you do a safe, dependable job.

GENUINE ALEMITE

Loader Pump

Model 6425 . . . portable, 35-lb. capacity pump for loading grease guns with light-bodied and semi-fluid lubricants. A very practical unit where machines being serviced are some distance from maintenance departments. Economical because it delivers lubricant only when gun is placed on loader valve. Complete with adapters and bracket for carrying gun.



GENUINE ALEMITE

Barrel Pump

Model 7710 . . . air operated. A rugged, heavy-duty pump. Used for large volume delivery of oils or fluid gear lubricants. Ideal for filling large crank cases, housings and large bearings requiring oil. This pump fits directly into the bung hole of a 55-gallon drum.

GENUINE ALEMITE

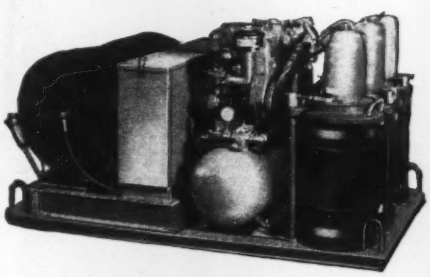
Grease Gun

Model 6679 . . . here is a heavy-duty gun that can take abuse and still do a dependable lubrication job. Has 21-ounce capacity and handles fibrous, heavy and light-bodied greases. Develops up to 5000 pounds pressure. Easily and quickly filled through a loader valve or by removing the cylinder head. It is spring primed. Extra long handle gives maximum operating ease. Used with hose or adaptors.

GENUINE ALEMITE

Portable Electric-Power Gun

Model 7191 . . . a high pressure unit complete with 25-lb. container. Standard model—110 volt A.C. Others available on request. Handles all types of light-bodied lubricants and delivers approximately 9-oz. per minute. Automatic switch shuts off motor at 5000-lbs. pressure. Rolls on two large rear wheels and one front Bassick caster. Comes completely equipped, ready to use.



Genuine Alemite Portable Service Station

Model 2417 . . . a version of the famous Alemite Portable Service Stations used on hundreds of high-priority wartime construction projects. This unit brings power lubrication out to machines on the job . . . services pressure gun fittings, gear housings, final drives, rear axles, transmissions and crank cases.

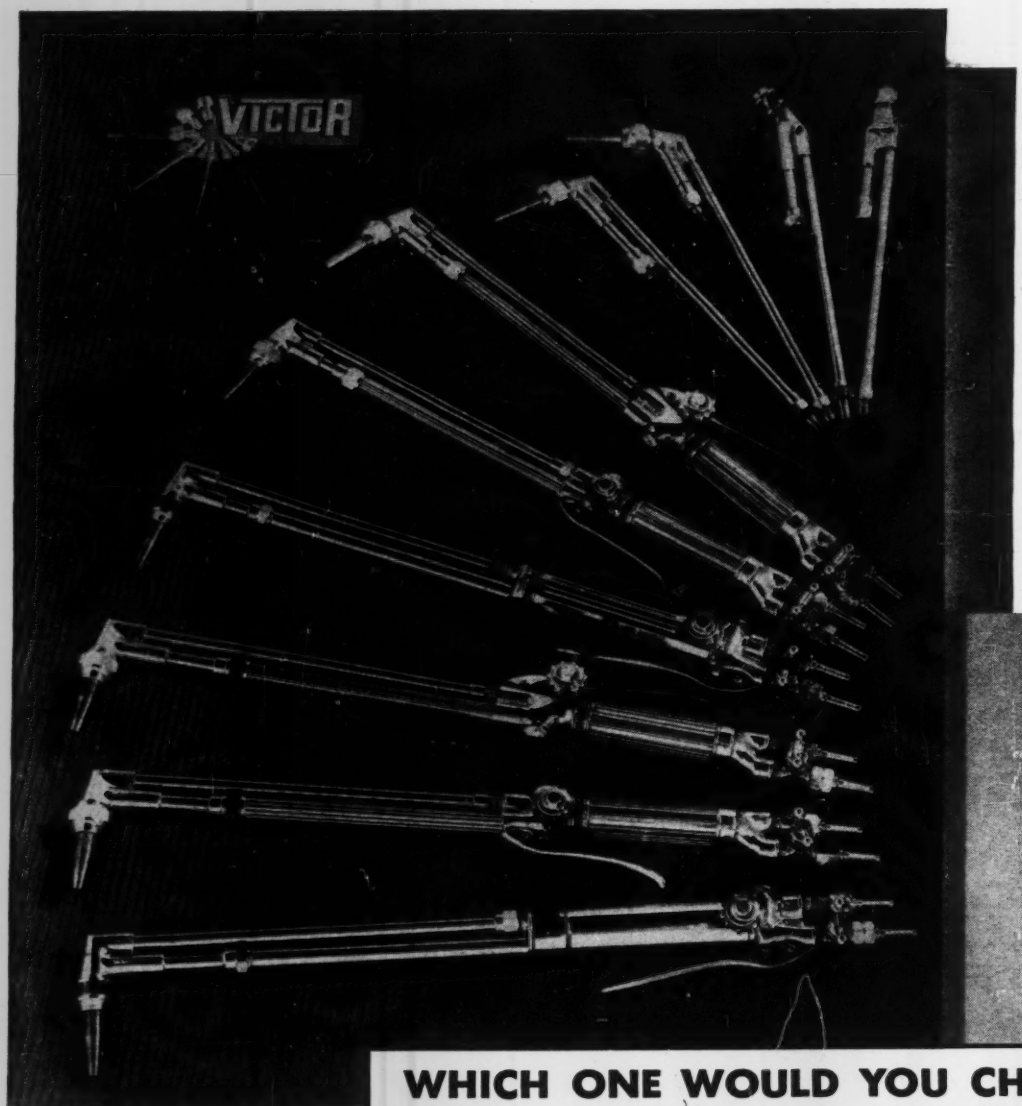
ALEMITE

First in Modern Lubrication

STEWART WARNER

For complete details, consult your Alemite distributor—or write direct to Alemite, 1821 Diversey Parkway, Chicago 14, Ill.

CONSULTATION • ENGINEERING • EQUIPMENT • LUBRICANTS • MAINTENANCE



WHICH ONE WOULD YOU CHOOSE? •

COMFORT TOO SAVES MONEY

Give your burner a cutting torch with the maximum comfort value. Some prefer the high pressure valve lever on top, some on the bottom, some in front and some in the rear of the torch. Which of these VICTOR hand cutting torches do you like the best? Of one thing you can be sure—no matter what the choice, VICTOR cutting torches are designed for maximum operating speed and minimum ownership cost.

VICTOR

VICTOR EQUIPMENT COMPANY

844 FOLSOM ST. • SAN FRANCISCO 7, CALIFORNIA

Ad 134

STEEL IS "HONORABLY DISCHARGED" —and ready for your plans

Now it's no longer necessary to substitute less satisfactory products for corrugated metal pipe.

With the war ended in Europe, Asia, and the Pacific, iron and steel have been "honorably discharged" and are again available for your drainage and other needs. During the days of material restrictions and substitutes you will recall how ARMCO Emergency Wood Pipe served a useful purpose. It was another unusual Armco service. But steel, so indispensable for ships, guns, equipment, landing mats, and for portable culverts in the forward areas, is also indispensable for peacetime construction.

Armco products have retained all their desirable features, such as light weight and ease of handling, flexibility and great strength. During their nearly forty years of distinguished service they have consistently proved their durability and saved taxpayers thousands of dollars. Now they are back in improved drainage and other structures—ready to serve you more efficiently and economically than ever before.

For immediate construction or for current and post-war plans, you will find Armco drainage and metal products a wise choice. Order them now or write for further information. Armco Drainage Products Association, 835 Curtis St., Middletown, O.

No longer needed for ammunition igloos, ARMCO MULTI PLATE bridges will again be the popular form of construction.

ARMCO

SCAN THIS LIST

ARMCO products: Corrugated Metal Pipe and Pipe-Arches, Paved Invert and Asbestos-Bonded Pipe, Perforated Pipe, MULTI PLATE Pipe, Arches and Pipe-Arches, Drainage Gates, Spiral Welded Pipe, Steel Sheeting, Retaining Walls, Tunnel Liner Plates, Guard Rail, End Sections.

THE CLUTCH THAT STOPPED CLUTCH TROUBLE

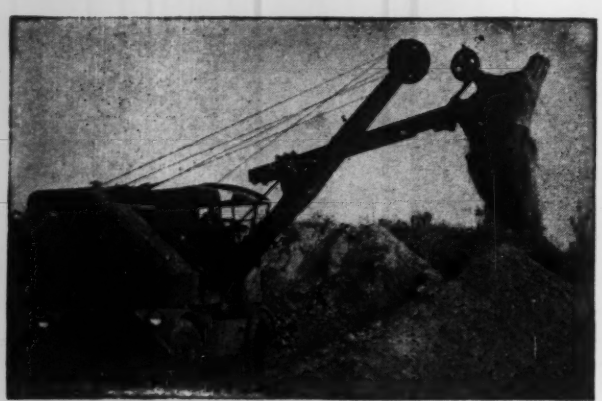
Here is the one truly modern clutch for all heavy duty industrial drives.

It controls power and torque through a cushion of air —with as firm a grip or as light a grip as the job requires. It has no springs, arms, levers or toggles—requires *no* lubrication and little maintenance.

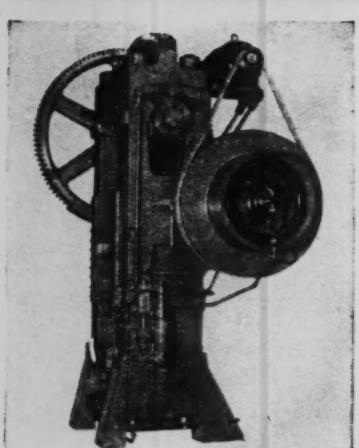
It is the Fawick Airflex Clutch—proved for superior performance and economy—in hundreds of industrial applications and in thousands of Diesel-driven Navy ships.

Let us help you engineer clutch trouble *out* of your machines. Book on request.

Oil-well drilling rig—equipped with 11 Fawick Clutches.

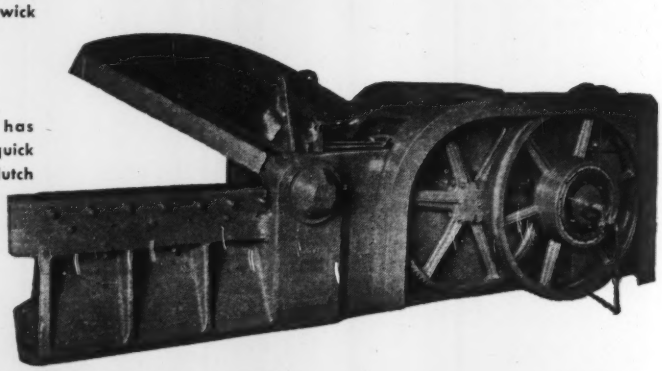


Steel rolling mill Fawick-equipped for smooth, even power.

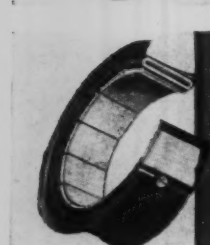


▲ Modern power shovel gives full-time operation through dependable Fawick Clutches.

◀ Heavy duty press has smooth starts and quick stops with Fawick Clutch and Brake.

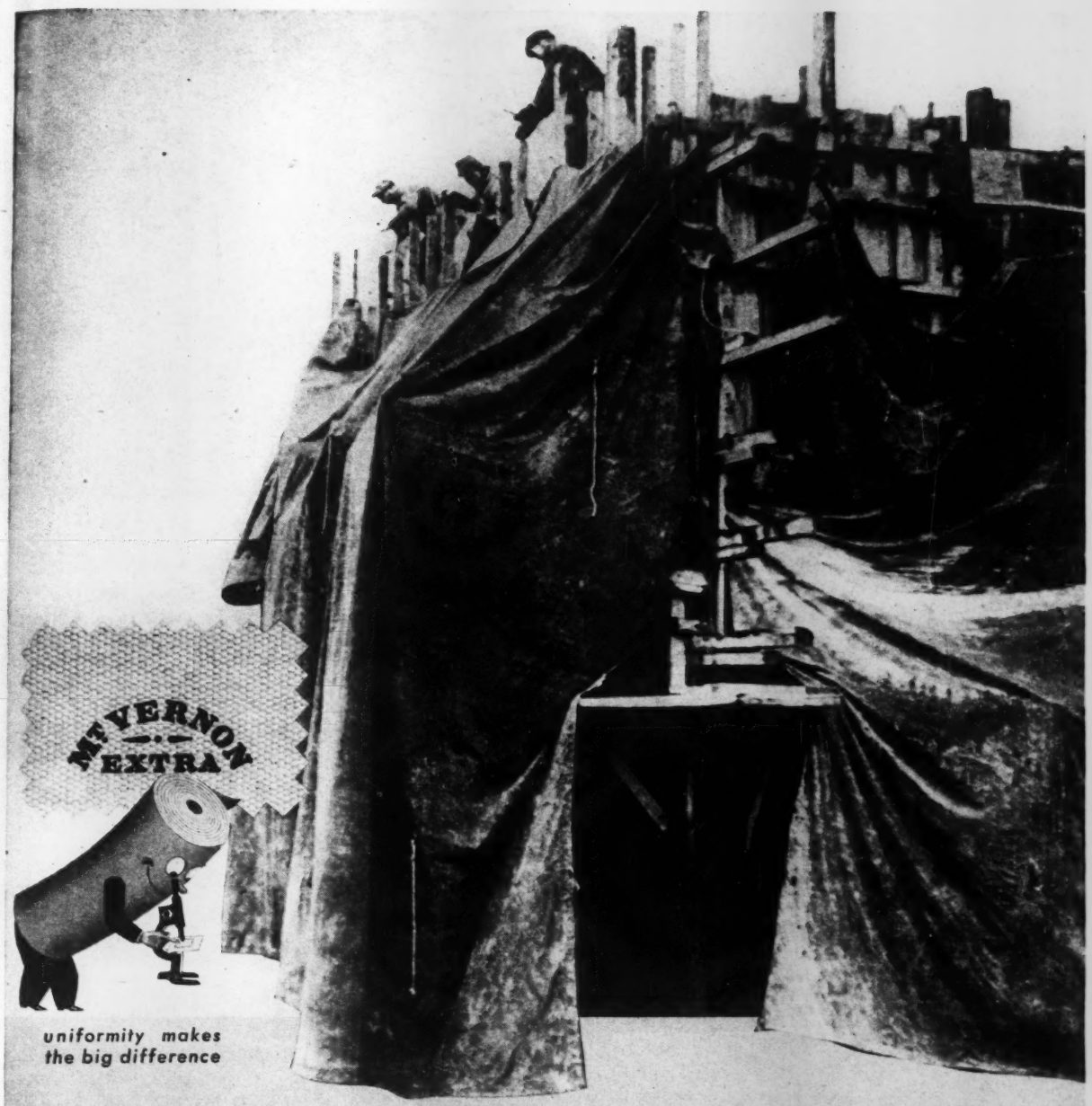


▶ Alligator shear operates through Fawick Clutch and Brake.



FAWICK *Airflex* CLUTCH

FAWICK AIRFLEX CO., INC. • 9919 Clinton Road, Cleveland 11, Ohio



THE HIDDEN TOUGHNESS IN UNIFORM TARPS

Wind, weather and rough handling put a severe test on tarp quality—but when the quality is MT. VERNON Extra, you're assured of tarps with a reserve of toughness that means longer life under the worst conditions of weather and wear. The secret lies in top grades of cotton used and fabrics woven to high uniformity, providing hidden extras of strength and toughness that you can depend on consistently—when you specify tarps made from MT. VERNON Extra.

MT. VERNON-WOODBERRY MILLS

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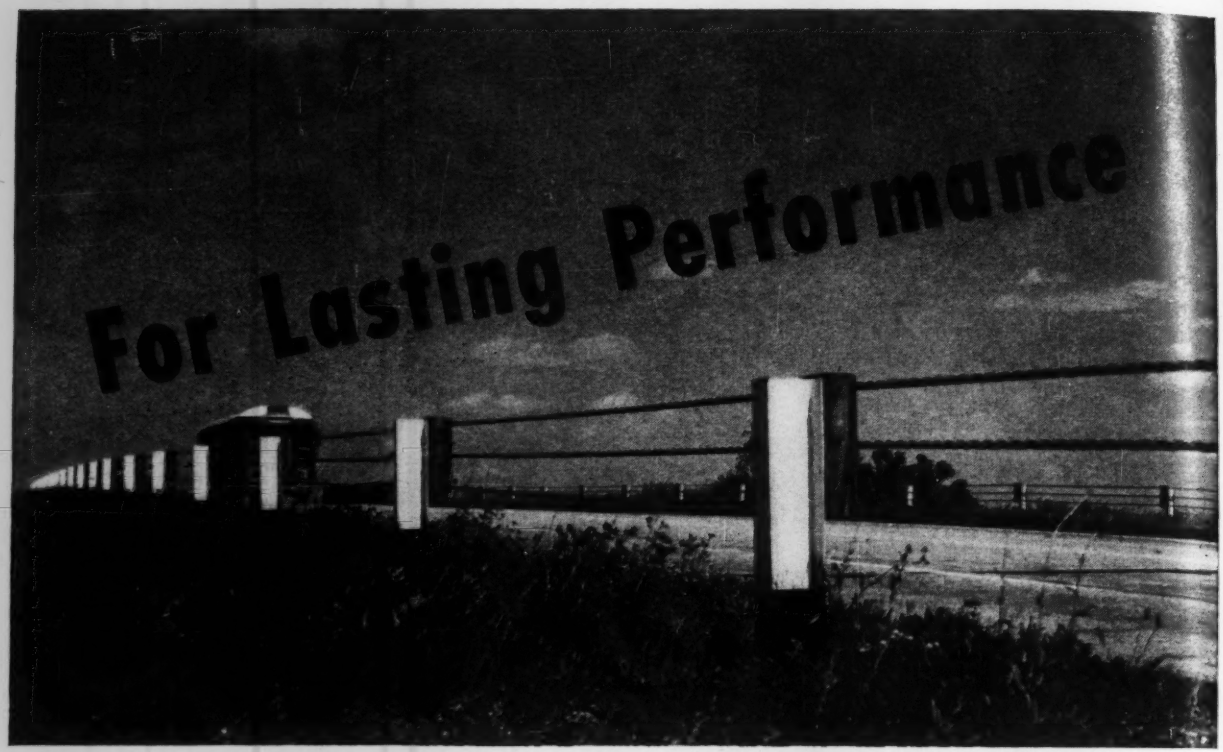


Bethlehem Guard Rail

Today, with steel guard rail an important part of so many highway programs, you'll find the Bethlehem line hard to beat.

When a runaway vehicle leaves the pavement sidewise—as happens in most accidents—there's a lot of safety in a Bethlehem Cable Guard Rail, mounted on Bethlehem Steel Guard Posts with Bethlehem Guard Brackets. The standard Bethlehem guard is made of durable, double-galvanized ¾-in. 3-strand cable, good for years of service. Properly-driven Bethlehem Guard Posts resist impact and side-thrust as well as, or better than, other kinds of posts. And the Bethlehem Highway Guard Bracket, which is made of high-tension spring steel, holds the cable and takes up much of the shock. When a one-piece guard rail is desired, there's the Bethlehem beam-type Safety-Beam rail, which no car can break through. Tough and smooth, it is made in standard lengths of 12 ft., 6 in., or can be supplied in lengths up to 50 ft.

These Bethlehem products are rugged and economically-designed—built to last, as are all of Bethlehem's line of highway steel products.

By ordering all the steel needed for a highway job from Bethlehem you'll get quick, reliable service—service that will save you money, paper-work and the possibility of idle men and equipment. It will pay you to buy steel from Bethlehem, for the big jobs ahead!

Bethlehem Safety-Beam Guard Rail

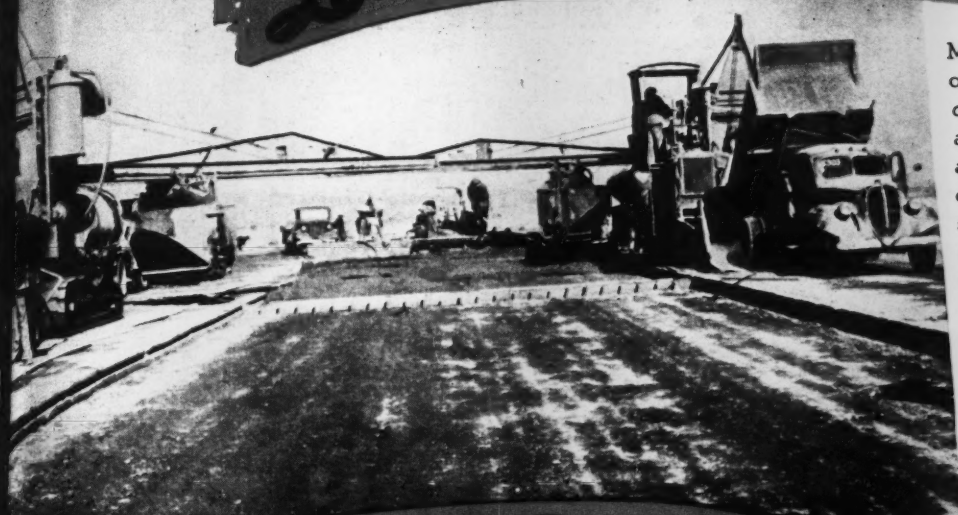
BETHLEHEM PRODUCTS FOR HIGHWAYS

Road Joints • Center Strip • Dowels Dowel Bar Supports • Reinforcing Bars Bar Mats • Bar Ties • Reinforcing for Concrete Pipe • Bridge Floor Reinforcing Concrete Slab Spacers • Welded Wire Fabric Guard Rails • Guard Posts and Brackets Wire Rope and Strand • Right-of-Way Fence and Posts • Anchor Rods • Pipe Hollow Drill Steel • Digging Bars • Structural Steel • Corrugated Sheets • Turnbuckles • Tie Rods, Spikes, Bolts and Nuts • Timber Bridge Hardware • Sheet and H-Bearing Piling

Full information about the Bethlehem line of road steels in our new illustrated catalog, "Steel for Highways," available through the nearest district office, or from Bethlehem Steel Company, Bethlehem, Pa.

★ BETHLEHEM STEEL ★

Lower Cost Concrete..



MultiFoote Pavers assure you of lower cost concrete because they get the cement and aggregate into the paver and out as thoroughly mixed concrete *faster*. Big, rugged skip has a full, wide mouth for faster charging from even the largest trucks. Double cone drum with its end-to-end scouring action mixes every batch in minimum time. Rotary discharge takes only a quarter turn to dump concrete into the big bucket. High operating platform provides greater visibility and faster, more accurate work. Write for details.

Lower Cost Black Top

ndling any mix—hot or d—Adnun Black Top ers lay a smoother final ace, faster and at lower . With a new, 6-cylinder ine, it has still more power handling the heaviest ks, uphill or down. Expeced road men who have ked with other pavers ee that the low maintenance s of an Adnun are far beyond those usually encountered other machines. Check e advantages today.

the FOOTE co.

INCORPORATED

1922 State Street ★ Nunda, N. Y.

The World's Largest Exclusive Manufacturers of Concrete and Black Top Pavers

STEPS FORWARD
MULTIFOOTE CONCRETE PAVERS

Less Bark . . . MORE BITE
with
ATLAS ROCKMASTER
and the
Rockmaster Blasting System

➡ The proven results of this newest Atlas First:

- **NOISE AND CONCUSSION** . . . the "bark" that caused so many complaints is drastically cut down.
- **ROCK BREAKAGE** . . . the "bite" that really counts most to superintendents . . . is decidedly more complete.
- **SECONDARY BLASTING** is reduced to a minimum.
- **BACK BREAK** . . . drillers get more solid footage due to far less back break.

It's good business on your part to investigate this important new blasting development at once.

A COMPLETE SYSTEM

Atlas Rockmaster and the Rockmaster Blasting System is a whole new method — a combination that means real money to you. The electric blasting cap is new — explosives have been geared to the job — and the selection, handling and loading processes have been redesigned.

Only the Atlas Representative can tell you about this exclusive Atlas development. Get in touch with him today — test the new Atlas Rockmaster System in your toughest shooting.

Results will amaze you.

You'll know Rockmaster
It's Blue

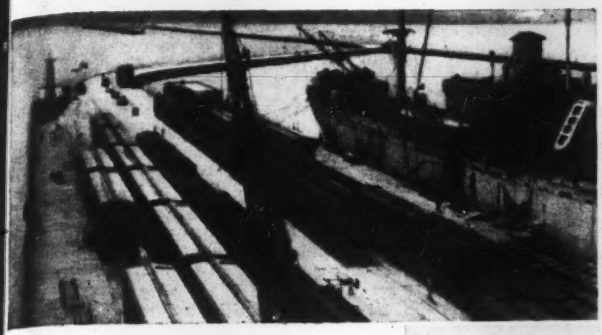
ATLAS ROCKMASTER

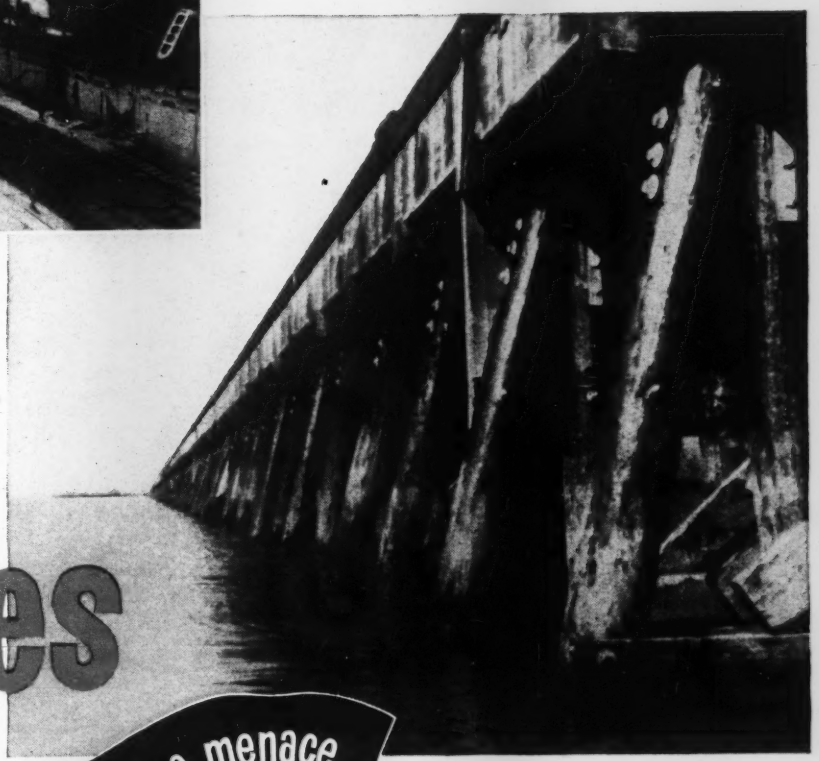
with the

GREATER SAFETY of ATLAS MANASITE DETONATORS

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco





These PRESSURE-CREOSOTED piles

lick a peace-time submarine menace

Extending for three miles, this tremendous pier on the Atlantic Coast carries miles of railroad track, and has facilities for loading a hundred ships at once. Since it was designed for permanent use, the engineers specified permanent materials, including pressure-creosoted piles and other structural members. Much of this material was treated by Koppers plants.

The importance of the protection of pressure-creosoting is shown by the almost incalculable damage done by marine borers to untreated piles. In a single west-coast harbor installation, damage has been estimated at $6,000,000 annually.

Experienced engineers depend on pressure-creosoted piles, as is indicated by their ever increasing use. In a recent 5-year period, 144,000,000 lineal feet were installed—enough to more than girdle the globe at the equator.

Pressure-creosoted foundation piles offer equally dependable protection against decay in installations where cut-offs are above the water table, and they also resist termite attack. Koppers plants are equipped to treat piles up to 130 feet long. Ask for quotations.

KOPPERS COMPANY, INC.—WOOD PRESERVING DIVISION

PITTSBURGH 19, PA.

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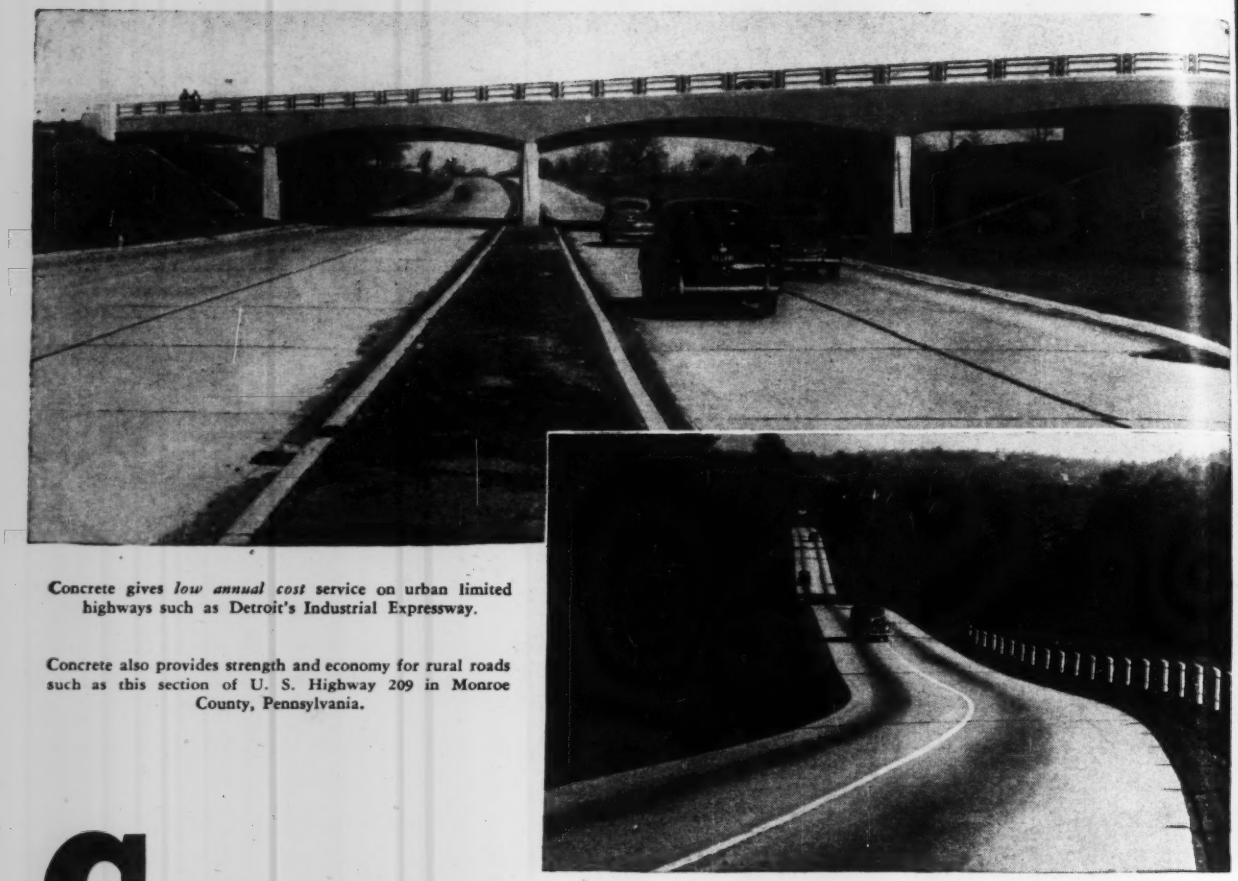
Buy Victory Bonds—and Keep Them!

THE INDUSTRY THAT SERVES ALL INDUSTRY



Concrete gives *low annual cost* service on urban limited highways such as Detroit's Industrial Expressway.

Concrete also provides strength and economy for rural roads such as this section of U. S. Highway 209 in Monroe County, Pennsylvania.

CONCRETE gives low-annual-cost pavement service

The strength and stamina of portland cement concrete pavement enables it to give long years of all-weather service.

For all but the lightest traffic, concrete pavement designed according to sound engineering principles usually costs less to build than any other pavement of equal load-carrying capacity.

LOW MAINTENANCE COST

Although the smooth-riding and all-weather safety of concrete roads generally attract the heaviest traffic, annual maintenance costs of concrete pavement have been uniformly lower than for other types of paving, even during the war years when concrete roads had to carry heavy overloads of war industrial traffic.

LOW ANNUAL COST

Low first cost, low maintenance expense and long life mean *low annual cost*—the reason why portland cement concrete is the logical pavement for new principal urban and rural highways and streets.

Write for data on latest concrete pavement designs for roads, streets or airports. Free in United States and Canada.

PORTLAND CEMENT ASSOCIATION

Dept. A12d-17, 33 W. Grand Ave., Chicago 10, Illinois

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work

CLEAR THE CONSTRUCTION SITE with International Diesel TracTracTors. They have the power—at low cost—to get the job done quickly. With 'dozer blades or land-clearing tools they root out trees, stumps and undergrowth, and clear away rocks or debris.

Put Internationals to work on homesite tracts, highway right-of-ways, bridge approaches, dam sites, airport locations or wherever there's work to do. And watch how they dig in and get things done!

International Tractors are dependable because of their instant-starting, efficient, *full Diesel* engines. They stand up under heavy punishment and continuous service because of their rugged construction and excellent weight-to-horsepower balance.

Yes Sir! Add up the features of International's engine, tractor construction, track-frame design, power transmission, lubrication and controls. The sum is *peak performance.* Isn't *that* what you want on your jobs?

Invest your tractor money in Internationals. It's money saved! That's why more and more discriminating operators are putting International Tractors on the important jobs.

Talk with the International Industrial Power Distributor near you for additional information about International Tractors, Engines, Power Units and allied equipment.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue — Chicago 1, Illinois

We'll see you at the A.R.B.A. Convention, Chicago, January 14-17.

INTERNATIONAL Industrial Power

STREAMLINING THE "SWING-BACK"

In these days of transition many manufacturers are going into the production of radically new products, becoming familiar with new equipment, adapting old machines to new uses and finding out how to control processes that are different. They are in the throes of a "swing-back" from wartime operation to peacetime manufacturing.

Inland metallurgists are familiar figures in many of these plants, where for years they have been applying their expert knowledge of putting steel to work for others.

Today, Inland metallurgists are continuing that valuable work. Their technical and practical experience in the selection of steel, in latest fabrication methods, and in speeding up output, are helping manufacturers produce many kinds of newer and better products.

If you have a problem in the use of steel, call on us. A member of our metallurgical staff will be glad to call and work closely with you.

Inland Steel Company, 38 S. Dearborn St., Chicago 3, Ill. Sales Offices: Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul. Principal Products: Bars • Structurals • Plates Sheets • Strip • Tin Plate • Floor Plate Piling • Reinforcing Bars • Rails • Track Accessories

INLAND STEEL

SOON

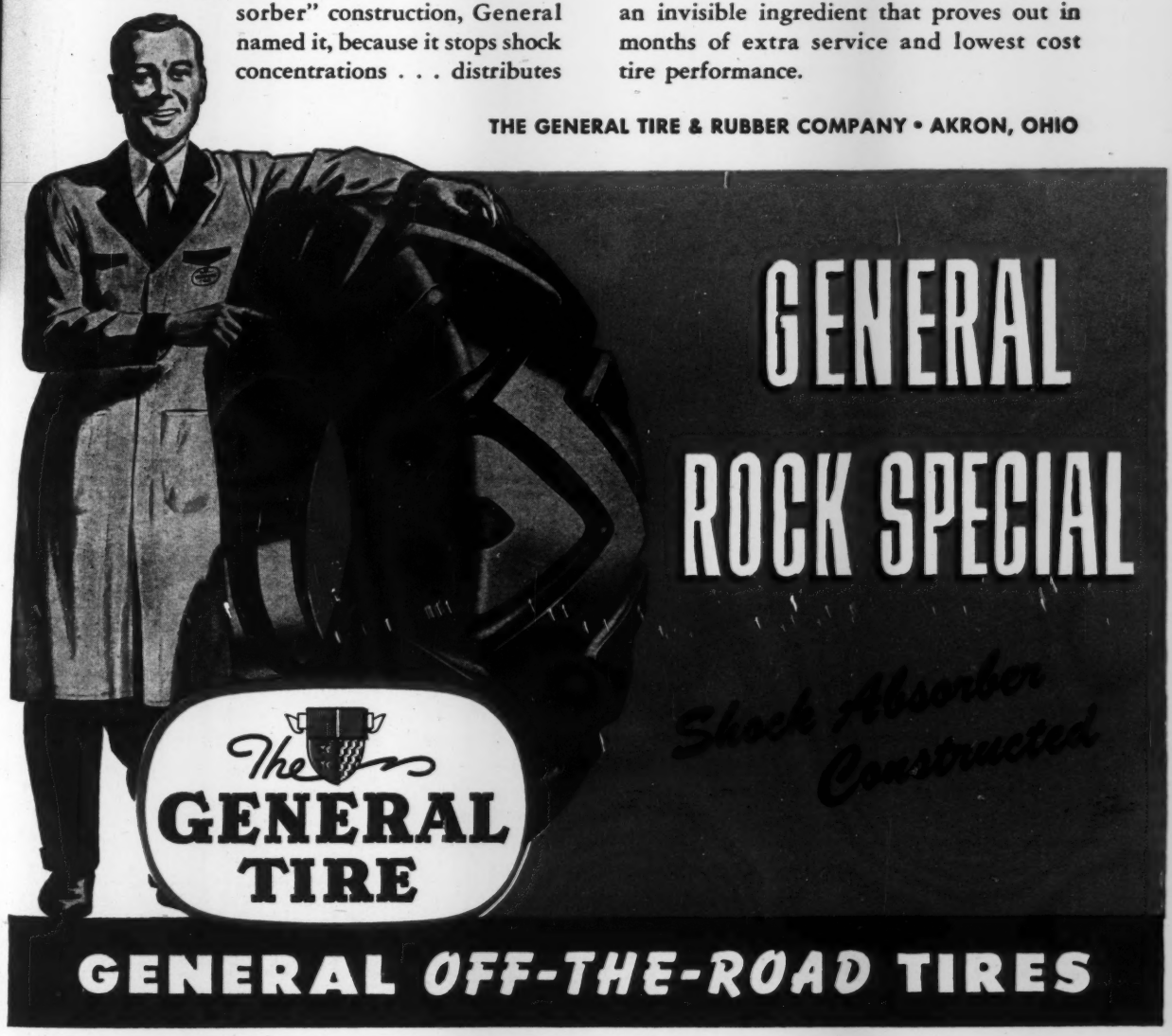
The toughest Rock Special of all Times!

● The General Rock Special is soon to be 100% virgin rubber again . . . and built to the toughest, heavy duty standards known.

Building synthetic rubber tires to do the same jobs as natural rubber tires during the war, developed and *proved* a new method of tire engineering at General. "Shock Absorber" construction, General named it, because it stops shock concentrations . . . distributes the loads and stresses uniformly . . . preserves the tire carcass under the hardest service conditions.

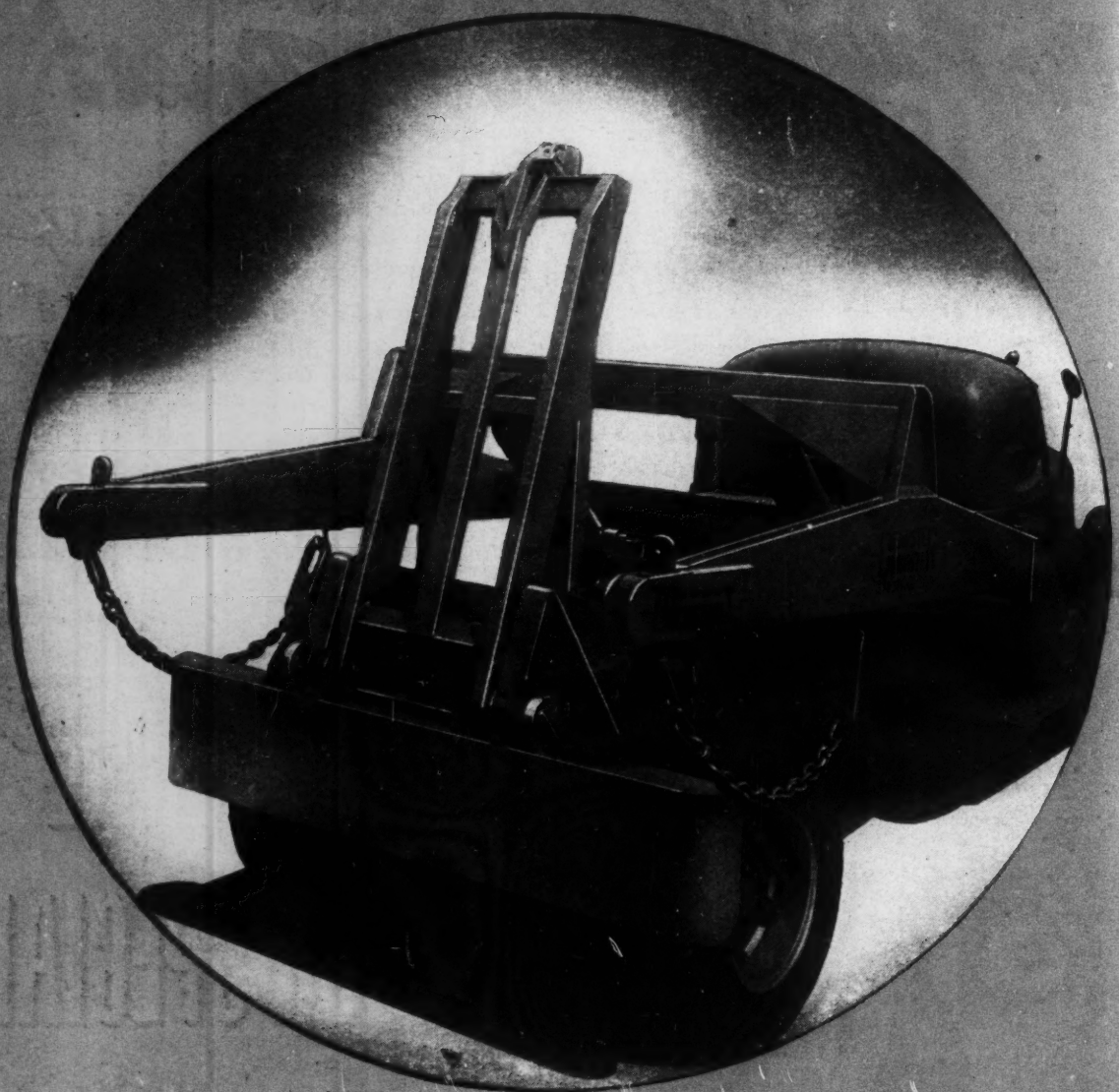
But General's coming Rock Special is more than just an engineered all-rubber tire. It will give you . . . as always . . . General's special kind of Top-Quality . . . an invisible ingredient that proves out in months of extra service and lowest cost tire performance.

THE GENERAL TIRE & RUBBER COMPANY • AKRON, OHIO



It's Simple... It's Sure...

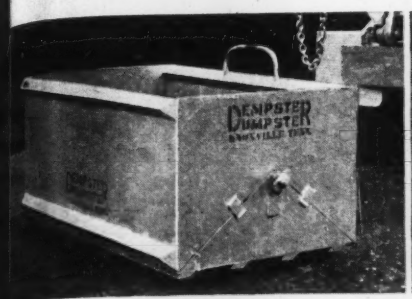
—CUTTING COSTS OF MATERIALS HANDLING THE DEMPSTER-DUMPSTER WAY!



★ Cutting costs of materials handling with the Dempster-Dumpster system is recognized very quickly by those already using conventional trucks. But, in hundreds of plants where materials handling systems are in use where trucks are not now required, the possibilities of the Dempster-Dumpster and its tremendous savings are often overlooked.

The Dempster-Dumpster is not an ordinary materials-handling-by-truck operation. The Dempster-Dumpster is a unit—made in several types and sizes—mountable on any truck chassis, for hoisting, placing in carrying position, and dumping any one of dozens of different types of Dempster-Dumpster bodies for handling every conceivable character of material. When installed on your truck chassis, this one unit will serve any number of bodies your operation may require. Some plants are using a single Dempster-Dumpster unit to serve 50 to 75 bodies. In certain cases several types of bodies, for various types of materials, are used, and all served by a single Dempster-Dumpster.

DEMPSTER DUMPSTER
TRADE MARK REG



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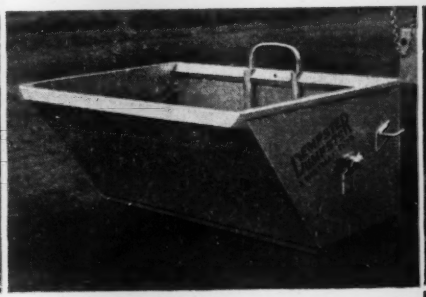

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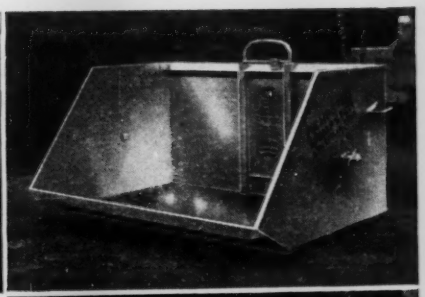

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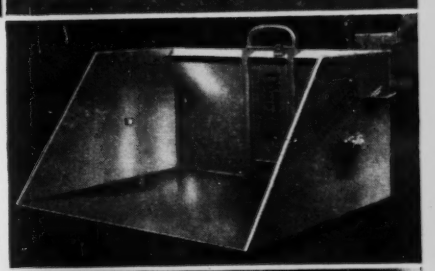

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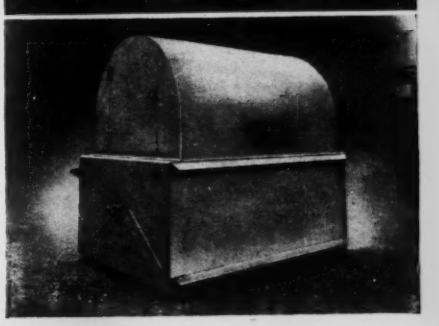


5

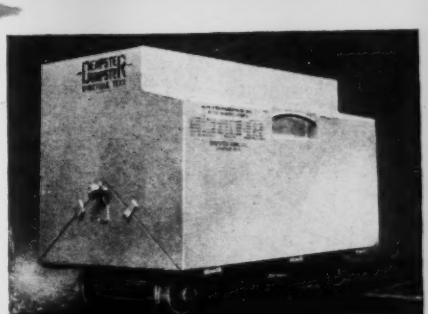
DEMPSTER DUMPSTER REGULAR BODIES

★ Shown above and at right, photos 1 through 5 inclusive, are five of our "regular" Dempster-Dumpster bodies. These are basic designs from which hundreds of variations, so-called "special" designs, are produced to meet the particular requirements of any materials handling problem. These "regular" bodies, in order, are: 1—Bottom dumping, 2—Tilt-type, 3—Skip-type with lip, 4—Skip-type flat bottom and, 5—Apartment-type for bulky materials, trash, or rubbish. These bodies are built in from 1½ to 10 cu. yd. sizes or 1½ to 7½ tons pay load capacities.

DEMPSTER DUMPSTER "SPECIAL" BODIES

★ Shown in photos 6 through 10 inclusive are five examples of "special" bodies, now serving some of the nation's largest industrial plants. Note in No. 6 that precision bearing, flanged car wheels have been adapted to a bottom dumping body. Wheels remain on body when picked up by Dempster-Dumpster for further transportation and dumping. Photo No. 7 shows a Tilt-type body developed for handling a semi-liquid material. No. 8 for handling dust collection. No. 9 for moulding sand. No. 10 for a finely ground material and having swivel casters for easy maneuverability in plant. Hot materials up to 1700° F are being handled by the Dempster-Dumpster, finished and unfinished products, light, heavy and liquid materials as well.

If you have any idea the Dempster-Dumpster may be adapted to your use to advantage, our engineers will gladly go over the matter with you. Write for our new Catalog No. 245 now. Dempster Brothers, Inc., Knoxville 17, Tennessee, U. S. A.



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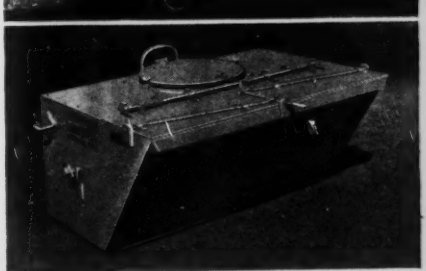

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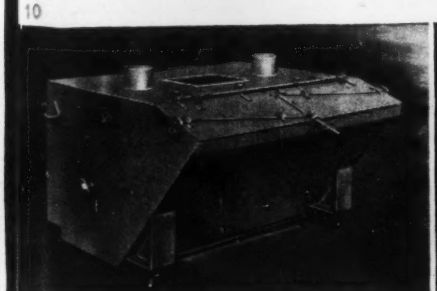

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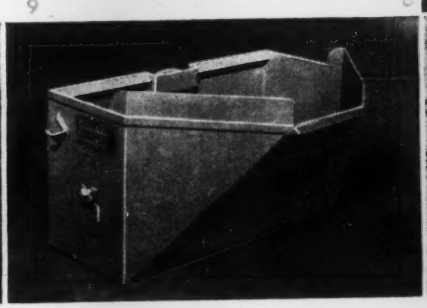
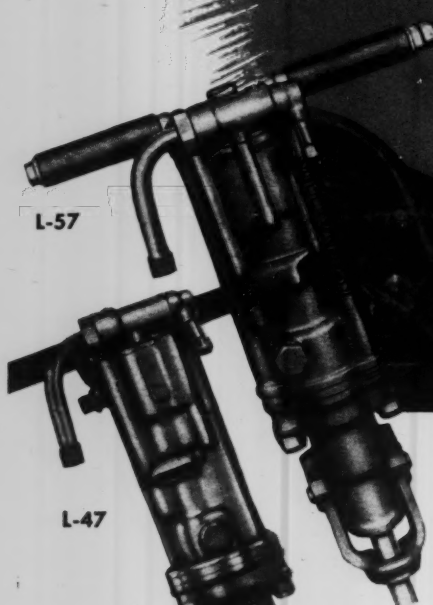


9

DOWN to ROCK BOTTOM

L-57



L-47

If it's rock-bottom drilling costs you want there's a Sullivan profit-maker for every job. From the small versatile L-1 to the husky, hard-hitting L-57, every Sullivan drill is packed with power but cushioned on air.

Both the 45-pound L-47 and the 55-pound L-57 drills are equipped with the exclusive Sullivan thrifty dual-valve that "makes air do more work." The dual-valve positively controls the volume of air for highest efficiency and gives a *controlled cushion ahead of the stroke.*

Wherever low-cost footage is important — contractors, municipalities, public utilities and counties turn to the complete line of Sullivan hand-held drills. Ask your nearest Sullivan distributor or branch office for details on hand-held drills and the other Sullivan products that can help you get your construction costs down to rock bottom.

PRODUCTS
Portable Compressors • Stationary Compressors • Rock Drills • Wagon Drills • Core Drills • Portable Hoists • Paving Breakers • Trench Diggers • Sheeting Drivers • and other Pneumatic Tools

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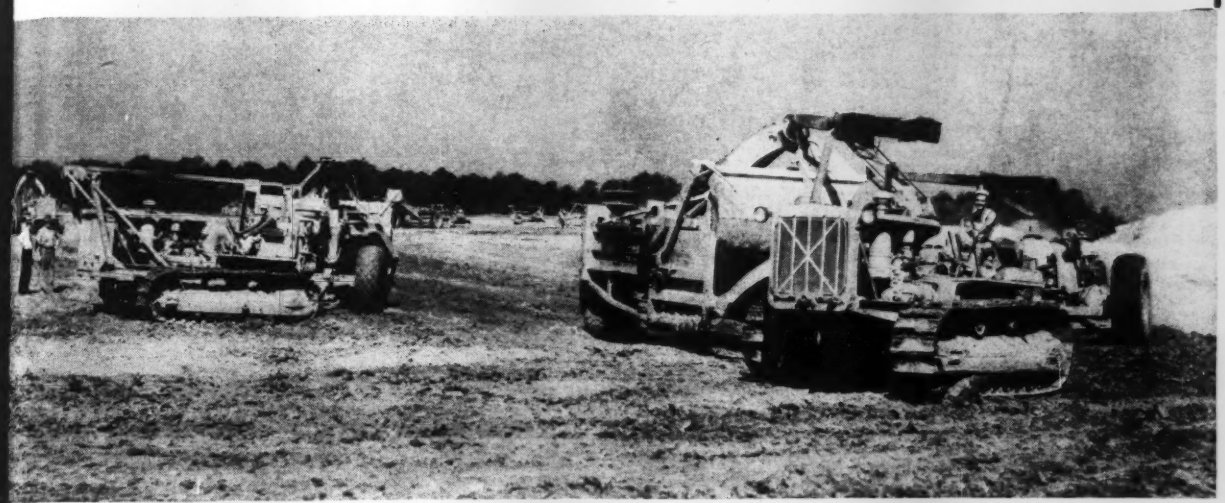
"GULF DIESELUBE H.D. keeps our engines clean, helps us get better performance and lower operating costs"—

*says the Contractor on this Airport project**



* Frank Mashuda Company, Mansfield, Ohio, recently completed the grading contract for the $3,000,000 Mansfield Airport project, which required the removal of approximately 2,000,000 yards of dirt. Gulf Dieselube H.D. helped this Contractor keep equipment on the job and operating efficiently.

GULF DIESELUBE H.D. has done a great job for us," says Frank Mashuda, Contractor on the Mansfield, Ohio, Airport project. "This heavy-duty oil keeps our engines clean—provides the kind of lubrication for both our gasoline and Diesel equipment that means better performance and lower operating costs."

Use Gulf Dieselube H.D. in your equipment and see how it can help you cut down on repairs and overhauls. Take advantage of the extra value you are offered in these four points of superiority in Gulf Dieselube H.D.:

1. Detergent action helps keep motors cleaner.
2. Helps prevent ring sticking and minimizes cylinder wear.
3. Noncorrosive to alloy bearings.
4. Nonfoaming under all temperature conditions.

Gulf Dieselube H.D. is approved and recommended by leading manufacturers for both automotive-type Diesels and for gasoline engines operating under heavy-duty conditions.

For further information on this modern heavy-duty oil, write, wire, or phone your nearest Gulf office today. If you have not yet received your copy of the new Gulf Diesel Lubrication Book, send the coupon below.

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Please send me, without obligation, a copy of the new Gulf book, "The Lubrication of Automotive Diesel Engines."

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PROPOSED CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *DARWIN R. DAY, Statistics* *J. A. MAHONEY, Reports*

(Daily service also available—Write for details)

WATER SUPPLY

PROPOSED WORK

Ariz., Benson—Town, Town Hall, plans completed drilling 2 wells, 250,000 gal. water storage tanks, and miscellaneous water lines. **$78,000.** Financing provided. Headman, Ferguson & Corollo, 325 Ellis Bldg., Phoenix, consult. engrs.

Ark., Flippin—City, City Hall, water supply, distr. sys. **$42,000.**

Calif., Compton—City, City Hall, plans completed 10 in. watermain from Rosecrans Ave. to Dixon in east roadway of Alameda Blvd., **$25,000;** 10 in. watermain from Rosecrans Ave. to Olive on Temple Ave., **$25,000;** 14 in. main from Aranbe to Alameda on Rosecrans Ave., **$24,000.** H. Carpenter, city engr.

★ **Calif., Glendale**—City, City Hall, plans completed 1,800,000 gal., rein.-con. reservoir, 2,000 ft. 20 in. and 1,500 ft. 42 in. lines, 2 pump houses, **$133,857;** 7 m.g. reservoir, 3,000 ft. 20 in. c.i. main, **$202,462;** 10 m.g. reservoir, 700 ft. 30 in. supply main, pump house, **$261,820.** J. C. Alberts, city engr. CD 3/15—ENR 3/22.

Calif., Healdsburg—City, plans completed water dam on Russian River. **$30,000.** H. M. Engle, 110 Sutter St., San Francisco, consult. engr. CD 5/19/43—ENR 5/27/43, under Postwar Projects.

Calif., Pasadena—City, City Hall, reservoir roof. **$70,000.** N. S. Jones, Water Dpt., ch. engr.

Calif., Torrace—Torrace Municipal Water Dist. No. 1, City Hall, water services improved. **$150,000.** Bond election January 15.

Conn., Noank—Town, Aubrey B. Sleath, 231 State St., New London, engr., water system storage and distribution, pipe lines, etc. Est. **$250,000.** Financing not provided.

Ia., Brayton—City, A. T. Rasmussen, mayor, WW sys. **$21,000.** Financing not provided. R. Gearhart, Cedar Rapids, consult. engr.

Ia., Laurel—City, H. C. McCleery, mayor, well, pump, pump house, storage tank, pipelines, etc. **$18,350.** Buell & Winter Engineers, 508 Insurance Exchange Bldg., Sioux City, consult. engrs.

Ia., Moulton — City, H. Morrow, mayor, reservoir imprvs., filtration plant. **$20,000.** Financing not provided. Brown Eng. Co., Valley Bank Bldg., Des Moines, consult. engr.

La., Breaux Bridge—G. Hebert, mayor, WW. **$74,000.** J. B. McCrary Co., Inc., 22 Marietta St. Bl., Atlanta, 3, Ga., consult. engr.

La., Duson—W. Lacy, mayor, Duson, WW. **$32,000.** J. B. McCrary Co., Inc., 22 Marietta St. Bl., Atlanta, 3, Ga., consult. engr.

La., Many—Town, Town Hall, plans 40% completed supply well, swimming pool. **$21,955.** Financing provided.

★ **Md., Baltimore**—City, City Hall, plans 50% completed water supply tunnel from city line on Liberty Rd. to Montebello Filtration Plant, **$5,400,000;** installing water pipeline from Hollofield Pump. Station to west city boundary, **$960,000;** water distr. connections, imprv., Druid Reservoir, **$86,000.** Financing provided. Whitman Requardt & Assoc., 1304 St. Paul St., consult engr. L. Small, Municipal Office Bldg., City Hall, engr. CD 5/8—ENR 5/10.

Md., Chestertown—City, City Hall, watermains, pump. station, wells. **$62,600.**

Md., Crisfield—City, City Hall, water sys. **$242,000.**

★ **Mich., Bay City**—City Water Dpt., Bay City, plans under way water sys. imprvs., incl. raw water storage, new intake extending 4 mi. into Saginaw Bay and modernization of existing sys., exceeding **$500,000.** Francis Engrg. Co., Eddy Bldg., Saginaw, consult. engrs. CD 12/1/44—ENR 12/14/44, under Postwar Projects.

Minn., Erskine—Village, E. Viall, clk., water supply and distr. sys. **$52,000.** Hitchcock & Estabrook, 521 Sexton Bldg., Minneapolis, consult engrs.

N. J., Perth Amboy—City, City Hall, plans under way 24 and 30 in. water transmission mains under Raritan River between Sayresville and Perth Amboy, **$450,000.** Financing not provided. L. P. Booz, 117 Smith St., city engr.

N. J., Vineland—Boro, Municipal Bldg., water well, mains. **$60,000.** H. A. Kuljian & Co., 1518 Walnut St., Phila., Pa., consult. engrs.

N. Y., Brooklyn—N. Y. Water Service Corp., 90 Broad St., New York, Zone 4, plans completed two 1 story, well vaults at 704-6 E. 34 St. and 643 E. 35 St. **$22,800.** Financing provided. A. T. Luce, 90 Broad St., New York Zone 4, consult. engr.

N. Y., Cornwall—Village, Village Hall, plans completed addnl. c.i. water pipe lines to Saw Mill, **$15,000;** watermain exten. and addnl. hydrants, **$5,000;** 1,200 ft. new 6 in. watermain and 3 hydrants, Hasbrouck Ave., **$6,888;** 6 in. water line, Hazen, Church and Clinton Sts., **$5,255.** Financing provided. H. Wood, Village Hall, village engr.

N. Y., Fairport — Village, Village Hall, plans completed WW sys. addns. **$38,428.** Financing provided. T. J. Morrison, 373 Grand Ave., Rochester, consult. engr. CD 3/19—ENR 4/5 under Postwar Projects.

N. Y., Freeport — Village, Village Hall, plans completed addnl. watermains. **$258,-562.** Financing provided. Baldwin & Cornelius, 61 Mount Ave., co. engrs. CD 10/27/44—ENR 11/16/44 under Postwar Projects.

N. Y., Frewsburg—Frewsburg Water Dist., Town of Carroll, plans completed water supply sys. **$83,080.** Financing provided. Wm. S. Lozier, 10 Gibbs St., Rochester, consult. engr.

N. Y., Garden City—Garden City Water Dist., Garden City, plans completed service bldg. and water pump. station. **$116,000.** Financing provided. J. W. Schmidt, Mt. Kisco, consult. engr. CD 6/28—ENR 7/12, under Postwar Projects.

N. Y., Little Falls—City, City Hall, plans completed 8 in. water line, West Main St. **$19,440.** Financing provided. R. D. Austin, City Hall, city engr. CD 10/27/44—ENR 11/16/44 under Postwar Projects.

N. Y., Morrisville—Village, Village Hall, plans under way, water main, **$22,300.** Linly Corp., 216 Cottage Place, Oneida, consult. engr. CD 7/6/44—ENR 7/27/44, under Postwar Projects.

N. C., Salisbury—City, R. E. Ramsey, mayor, water filtration and storage plant. **$414,023.** CD 12/3.

N. D., Fargo—City, F. C. Hagen, comr., City Hall, WW imprvs., incl. plant addn., new equip. **$200,000.** Financing provided. Black & Veatch, 4706 Bway., Kansas City, Mo., consult. engrs.

N. D., Grafton—City, City Hall, filtration plant. **$200,000.** Financing not provided. Lium & Burdick, Grand Forks, consult. engrs.

N. D., Wahpeton—City, City Hall, water filtration and softening plant. **$105,000.** Financing not provided. Lium & Burdick, Grand Forks, consult. engrs.

Okla., Rush Springs—Town, watermains. **$20,000.** Financing not provided.

Okla., Atoka—W. R. Sample, mayor, City Hall, WW imprvs. **$137,676.** Collins Engrg. Co., McAlester, consult. engr.

Okla., Checotah—City, plans completed exten. water distr. sys. and addnl. pump. equip. **$20,000.** Financing not provided. Rex Collins, McAlester, consult. engr.

Okla., Edmond — City, D. W. Banzett, mayor, City Hall, exten. WW sys. **$170,000.** Bonds voted. C. W. James, Britton, consult. engr. Flora Jefferies, city clk. CD 11/27—ENR 10/18.

Okla., Kiowa—L. R. Davison, mayor, WW. **$26,000.** R. B. Decker, 432 Mayo Bldg., Tulsa, consult. engr.

Okla., Konawa—City, plans waterworks extensions, **$15,000.** Financing not provided. H. T. Lawrence, 1802 N.W. 21 St., Oklahoma City, consult. engr.

Okla., Okeene—City of Okeene, addn. pumping equipment and water extensions, **$20,000.** Financing not provided. E. A. Jones, Blackwell, engr. CD 11/29—ENR 1/10.

★ **Okla., Oklahoma City**—City, City Hall, voted **$1,842,000** bonds, WW extens. R. Lee Jr. City Hall, city engr. CD 10/29—ENR 11/15.

Okla., Woodward—City, City Hall, voted **$214,500** bonds, addnl. water wells, watermain extens. Alexander & Pollard, Terminal Bldg., Oklahoma City, consult. engrs. CD 11/12.

Ore., Metzger—Metzger Water Dist., c/o J. T. Chinnock, Railway Exchange Bldg., Portland, 4 mi. 10 in. c.i. pipe connecting with Portland water sys. **$80,000.** Financing provided. C. E. Carter, 822 Spalding Bldg., Portland, consult. engr. CD 5/16—ENR 5/24.

Ore., Portland — Parkrose Water Dist., 10404 N.E. Sandy St., installing 12 mi. 6- to 16-in. cement lined, c.i. mains, near here. Over **$150,000.** Financing provided. J. Sturdgeon, 10404 N.E. Sandy St., engr.

Pa., Blairsville—Boro, Boro Hall, concrete dam, storage reservoir. **$50,000.** Financing not provided. S. Taylor, Gulf Bldg., Pittsburgh, consult. engr.

Pa., North Warren—Boro Council, T. Peterson, chn. Bldg., Com., North Water water supply and distr. sys. **$35,000-$40,000**

Pa., West Leechburg — West Leechburg Boro, water plant, filtration plant, distr. sys. storage tank. **$150,000.** R. F. Wilp[illegible] Bldg., Pittsburgh, boro engr.

S. D., Herried—City, WW and tank sewer and sewage plant. **$80,000.** Financing provided. A. S. Mannes, Aberdeen, consult. engr.

S. D., Willow Lake—City, exten. water and sewer lines. **$80,000.** Financing provided. A. S. Mannes, Aberdeen, consult. engr.

Tex., Alta Loma—W. H. Brockman, pres. Galveston Co. Water Control and Improv. Dist. 8, Alta Loma, plans under way water and sewer imprvs. **$128,000.** J. J. Rady, 807 Insurance Bldg., Fort Worth, consult. engr.

Tex., Boerne—City, City Hall, plans [illegible] completed WW sys. imprv., **$50,000.** Financing provided. Austin Engrg. Co., 203 Riverside Dr., Austin, consult. engr. CD 10/23—ENR 11/15.

★ **Tex., Dallas**—City, City Hall, voted bonds water lines, facilities. **$2,900,000.** CD 11/5—ENR 11/29.

Tex., Elm Mott—Elm Mott Independent School Dist., Elm Mott, drilling, developing artesian water supply well. **$18,000** bonds voted.

Tex., Fort Worth—City, City Hall, water pump. plant addn., remodeling. **$210,000.**

Tex., Galveston — City, G. W. Frazer, mayor, City Hall, voted bonds, c.i. water lines, **$115,000.** P. A. Milligan, City Hall, engr. CD 10/25—ENR 11/15.

Tex., Llano—M. C. Dalchaw, mayor, City Hall, WW sys. imprvs., incl. sanitary sewers and electrical distr. sys. addns. **$400,000.** Financing provided. Consolidated Architects & Engineers, Fort Worth National Bank Bldg., Fort Worth, consult. engrs. CD 11/12—ENR 11/29.

Tex., Pampa—Town, Town Hall, plans 50% completed water sys. imprvs. **$50,000.** Financing provided. J. E. Ward, 545 Allison-Duncan Bldg., Wichita Falls, consult. engr. CD 9/28—ENR 10/5, under Postwar Projects.

Tex., San Antonio—W. K. Ewing, c[illegible] F. H. Wolff, Alamo Natl. Bldg., plans 50% completed, c.i. water lines, imprvs. Terrell Heights Place, **$45,000.** Financing provided. Hare & Hare, 114 W. 10 St., Kansas City, Mo., consult. engrs. R. Andricks, Milam Bldg., consult. engr.

Tex., San Antonio—Travis-Soledad Corp. & Assoc., Travis Bldg., plans 50% completed c.i. water lines. **$18,000.** Financing provided.

Tex., Seymour—C. M. Randal, mayor, City Hall, WW imprvs. **$73,500.** J. E. Ward, Allison-Duncan Bldg., Wichita Falls, consult. engr.

Tex., Whitewright—F. M. Echols, mayor, City Hall, WW imprvs. **$25,000.** J. Montgomery, Nalle Annex, Austin, consult. engr.

Va., Portsmouth—City, rebuilding filtration plant at Suffolk, **$330,000;** 450,000,000 gal. water storage dam at Lake Kilby, **$132,000.**

Wash., Lake Stevens—Pub. Utility Dist. No. 1, Everett, water distribution sys. **$250,000.** Financing not provided. J. W. Carr & Co., Alaska Trade Bldg., 1917 1 Ave., Seattle 1, consult. engr. CD 7/12—ENR 7/29.

Wash., Longview—Pub. Utility Dist. 1, Kelso, plans under way water sys. serving Lexington, Beacon Hill, Monticello Acres and adjacent areas. **$100,432.** Financing not provided. H. L. Gray, Henry Bldg., 4 and Union Sts., Seattle, 1, consult. engr.

Wash., Morton—Town, Town Hall, plans under way 1 m.g. gal. storage tank and connecting watermain. **$47,600.** Financing not provided. O. R. Hyde, 514 Provident Bldg., Tacoma, consult. engr.

Wash., Reardan — City, City Hall, new source water supply, storage and lines. **$15,000.** Financing not provided. W. L. Malony, Symons Bldg., Spokane, consult. engr.

Wis., Wrightstown—City, water supply sys. **$64,520.** Foth, Boyd and Porath, 409 E. Walnut St., Green Bay, consult. engrs. CD 12/3—ENR 12/13.

Alta., Raymond—Town, waterworks sys. **$100,000.** Hadden & Miles, 9 Argyle Court, Calgary, engrs. CD 9/4—ENR 9/6.

N. B., East Bathurst—Municipality, WW sys. **$40,000.**

Ont., Hearst—Municipality, E. Cherrier, clk., WW sys. **$40,000.** G. G. Reid, 7 Edmund Ave., Toronto, engr.

Que., Lauzon—Municipality, J. A. Allaire, mayor, watermains, tank, etc., **$25,000.**

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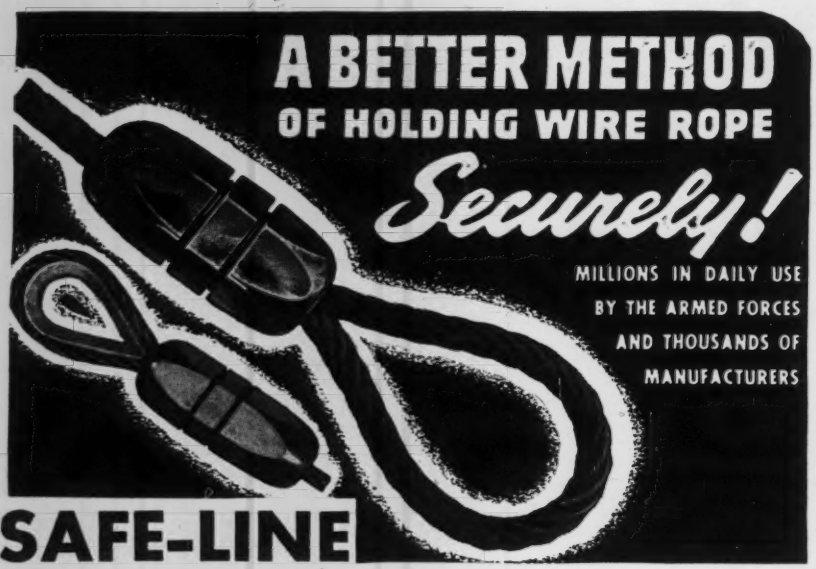

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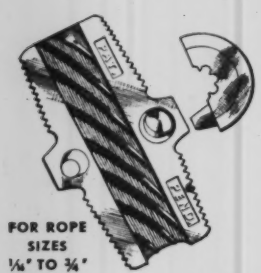

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WATER SUPPLY (Proposed Work, Co'd)

Que., Ste. Anne — Municipality, WW imprvs., extens. $35,000. Lavoce & Delisles, Tremblay Bldg., Chicoutimi, engr.

Sask., Regina Beach—Village, water system, incl. reservoir and pumping station, $45,000.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Ariz., Coolidge—Town, Town Hall, A. D. Tyler, mayor, plans completed collecting sys., outfall line, disposal plant, treatment plant. $283,900. Financing provided. Headman, Ferguson & Corollo, 325 Ellis Bldg., Phoenix, consult. engrs.

Ariz., Mesa—City J. Edwin Miller, clk., City Hall, plans completed sewage treatment plant. $76,900. Financing provided. Headman, Ferguson & Corolla, 325 Ellis Bldg., Phoenix, consult. engrs.

Ark., Marshall—City, M. L. Potts, mayor, sewerage sys. $60,250. Dickinson & White, Rector Bldg., Little Rock, consult. engrs.

Ark., Mountain View—City, H. Massey, mayor, sewerage sys. $64,700. M. L. Crist & Associates, Union Life Bldg., Little Rock, consult. engrs.

Ark., State Sanatorium—Dr. J. D. Riley, secy. Bd. Trustees Arkansas Tuberculosis Sanitorium, sewage disposal plant. $57,000. R. E. Williams, 1008 Pyramid Bldg., Little Rock, consult. engr.

Calif., Banning—City, plans completed Williams St. Storm Sewer, Sect. 1, $43,571; Sect. 2, $49,412. W. H. Wood, city engr.

Calif., Beverly Hills—City, plans completed storm drain, drain pipes, 21 manholes, 65 catch basins in Santa Monica Blvd. $94,360. W. R. Metz, 450 N. Crescent Dr., city engr.

Calif., Claremont—City, plans completed sewer collection mains, Mountain Ave. to 10 St., Oak to Alexander Sts. $27,000. J. B. Marcellus, city engr.

Calif., Huntington Beach—City, plans completed, storm drains, Ocean and 7 Sts., Ocean and 16 Sts. $44,000. H. A. Overmeyer, city engr.

Calif., Laguna Beach—City, plans completed sanitary lateral sewers, trunk sewer, enlarging sewage treatment plant. $130,000. J. R. Lester Boyle, 505 Forest Ave., consult. engr.

Calif., Los Angeles—Los Angeles Co., Hall of Records, 3.42 mi. sanitary sewer in Isis Ave., Imperial Highway, Aviation Blvd., Inglewood-Redondo Rd., 118 Pl., 119 Pl., 115, 116, 117, 119, and 120 Sts. $59,700. A. Jones, Hall of Records, engr.

Calif., Santa Rosa—City, City Hall, reconstructing sewage disposal sys. $300,000. Bonds voted. CD 11/13—ENR 11/29.

Calif., Spadra—City, plans completed sewage disposal plant addn. $226,000. Black & Veach, 4706 Broadway, Kansas City, Mo., consult. engr. F. C. Froehde, city engr.

Ill., Palatine—Town, M. E. Plate, supt. P. Wks., Palatine Town Hall, Springfield, surveys either 2 small sewage disposal plants or 1 large one. $165,000. C. Ashley of Wells Engineering Co., Geneva, consult. engr.

Ind., Farmland—Town, Town Hall, treatment plant and sewers. $30,000 or more.

Ia., Le Claire—City, L. Herman, mayor, City Hall, plans under way, sewers, sewage disposal plant. $83,000. Financing not provided. R. W. Gearhart, Cedar Rapids, consult. engr.

Kan., Holyrood—City, E. J. Snyder, mayor, sewers and sewage plant. $66,100. Financing provided. Wilson & Co., P.O. Box 518, Salina, consult. engrs. CD 11/29.

Kan., Lenexa—City, W. T. Keller, mayor, sewers, sewage plant. $55,500. Financing not provided. Shockley Eng. Co., Reliance Bldg., Kansas City, Mo., consult. engr.

Kan., Miltonvale—City, A. Lavol, Jr., mayor, City Hall, sanitary sewers, sewage disposal plant. $88,000. Financing not provided. Wilson & Co., P.O. Box 518, Salina, consult. engrs.

La., St. Francisville—J. R. Matthews, mayor, St. Francisville, sewerage sys. $50,000. J. B. McCrary Co., Inc., Lafayette, consult. engr.

La., St. Joseph—G. Baker, mayor, St. Joseph, sewerage sys. $74,630. Barnard & Burk, Triad Bldg., Baton Rouge, consult. engrs.

Md., Baltimore—City, City Hall, plans 25% completed altering trickling filters at Back River Sewage Disposal Plant. $245,000. Financing provided. Whitman Requardt & Assoc., 1304 St. Paul St., consult. engrs. G. E. Finch, Municipal Office Bldg., sewer engr. CD 2/7—ENR 2/22, under Postwar Projects.

Md., Crisfield—City, City Hall, exten. sewer mains, treatment plant and pump stations. $300,080.

Md., Reisterstown—Comrs. Baltimore Co., Court House, Towson, plans 25% completed sewage treatment plant. $207,900. Financing provided. G. Douglas Andrews, Court House, Towson, engr.

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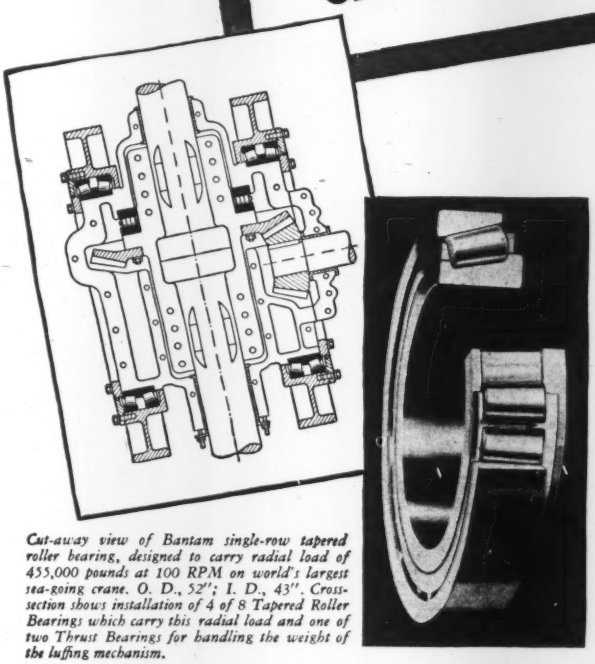

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SEWERS (Proposed Work, Cont'd.)

Mass., Haverhill—Commonwealth of Massachusetts, Dpt. P. Wks., 100 Nashua St., Boston, plans under way drainage, South Main St., over **$25,060.** J. Kritter, 162 North St., Haverhill, consult. engr.

Mass., Leominster—City, Mayors Office, Municipal bldg., 4 mi. exten. sewage disposal sys., **$75,000;** addnl. storm sewers, **$25,000.** Wm. P. Pray, 30 South Cotton St., consult. engr.

★**Mass., South Essex**—South Essex Sewerage Dist., Sewerage Com., Salem, Mass., extensions and improvements to sewerage sys., Beverly and Salem Harbors, **$500,000.** Financing not provided. Metcalf and Eddy, 1300 Statler Bldg., Boston, consult. engrs. CD 11/13—ENR 11/29.

Mich., Flint—City, City Hall, plans under way sewage plant imprvs., incl. sludge digestor, tank with heating coils. **$160,000.** Ayres, Lewis, Norris & May, Wolverine Bldg., Ann Arbor, consult. engrs.

Mich., Iron Mountain and Kingsford—City of Iron Mountain and village of Kingsford, sewage treatment plant. **$267,000.** Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Ill., consult. engrs. H. T. McNeely, Iron Mountain, city engr. J. J. Cummings, Kingsford, village engr.

Minn., Hallock—Village, C. N. Fowler, clk., Village Hall, sewage treatment plant. **$50,000.** W. C. Larson, Detroit Lakes, consult. engr.

Minn., Lindstrom—Village, G. Johnson, clk., sanitary sewers, sewage treatment plant. **$70,000.** Banister Engrg. Co., 1547 University Ave., St. Paul, consult. engrs.

Minn., Moorhead—City, R. G. Price, clk., sewage disposal plant. **$50,000.** W. C. Larson, Detroit Lakes, consult. engr. CD 6/9/43—ENR 6/17/43, under Postwar Projects.

Minn., Red Lake Falls—Village, W. Nieland, clk., Village Hall, sanitary sewer, water facilities. **$100,250.** W. C. Larson, Detroit Lakes, consult. engr.

Mo., Knobnoster—City, J. W. Sibert, mayor, sanitary sewers, treatment plant. **$67,460.** Financing not provided. J. W. Shikles & Co., Reliance Bldg., Kansas City, Mo., consult. engrs.

Mo., Perry—City, W. E. Boyd, mayor, City Hall, sewers, sewage disposal plant. **$51,000.** Financing not provided. W. B. Rollins & Co., Railway Exchange Bldg., Kansas City, consult. engrs.

★**Mo., Wellston**—Wellston Sewer Dist. c/o Bd. of Trustees, St. Louis, 14, sanitary sewers, storm sewers, within district. **$1,638,000.** H. Shifrin, Shell Building, 1221 Locust St., St. Louis, Zone 3, ch. engr.

Mont., Billings—City, H. E. Biddinger, mayor, City Hall, plans bond election sewerage sys. and disposal plant. **$600,000.** Black & Veatch, 4706 Bway., Kansas City, Mo., consult. engrs. CD 14/4/44—ENR 12/14/44, under Postwar Projects.

Mont., Dodson—City, City Hall, vitr. clay sewerage sys., disposal plant. **$47,000.** Financing provided. Corwin & Co., Inc., Medical Arts Bldg., Great Falls, consult. engr.

Mont., Hot Springs—City, City Hall, sewerage, sewage treatment plant. **$80,000.** Corwin & Co., Medical Arts Bldg., Great Falls, engrs. CD 10/17—ENR 11/1.

N. J., Audubon—Boro, Boro Hall, plans completed, storm sewers, E. Atlantic, Logan, Ward Aves. and Marshall's Br., **$123,000.** Financing not provided. H. N. Hammon, 310 Market St., Camden, consult. engr.

N. J., Carlstadt—Boro, Boro Hall, plans completed storm water sewers and sanitary sewer, **$25,950.** Financing not provided. F. C. Job, 241 Main St., Hackensack, consult. engr.

N. J., Glen Rock (br. Ridgewood)—Boro of Glen Rock, plans completed 10 in.c.i. force main and 12 in. vitr. tile collection sewer. **$77,000.** Financing not provided. F. M. Evans, Municipal Bldg., engr.

★**N. J., Hamilton**—Twp., Hamilton, plans under way 16,037 lin. ft. rein.-con. drain, Broad St. Park Area, **$838,240.** Financing not provided. A. E. Riley, 2090 Greenwood Ave., Hamilton, twp. engr.

N. J., Paulsboro—Boro, sewage treatment plant addn., Proj. No. 1-28-P-209, **$27,750;** storm water drainage, various streets, Proj. No. 1-28-P-210, **$116,500.** W. A. K. Conover, 8 N. Broad St., Woodbury, boro engr.

N. J., Rahway—City, storm drains, Montgomery St., **$20,000;** Hazelwood Ave., **$50,000;** St. George Ave. and Hamilton St., **$25,000;** Pierpont St., **$90,000;** Sycamore St., Jefferson and West Meadow Aves., **$80,000;** Plainfield and St. Georges Aves., **$150,000;** Central Ave., **$10,000;** sanitary sewer interceptor, Milton Lake Manor, **$60,000;** St. Georges and Plainfield Ave., **$35,000;** sanitary sewers, vicinity Irving and Hamilton Sts., **$20,000;** St. Georges Ave., etc., **$8,000.** Financing not provided. C. S. Bush, city engr. CD 12/21/44—ENR 1/11, under Postwar Projects.

N. J., Runnemede—Boro, sanitary sewerage sys., treatment works. **$350,000.** Financing not provided. A. C. Robertson, 505 Cooper St., Camden, consult. engr.

N. J., Thorofare—West Deptford Twp., sanitary sewers in Colonial Manor, Ardena and Verga Sanitary Sewer Dists. **$178,000.** W. A. K. Conover, 8 N. Broad St., Woodbury, twp. engr.

N. J., Vineland—Boro, Boro Hall, sewage disposal plant imprvs., trunk sewer, **$105,000.** H. A. Kuljian & Co., 1518 Walnut St., Phila., Pa., consult. engr. CD 9/2/44—ENR 10/5/44, under Postwar Projects.

N. J., Williamstown—Monroe Twp. Municipal Bldg., sewerage sys., sewage treatment plant, Proj. 1-28-P-204. **$344,500.** W. A. K. Conover, 8 N. Broad St., Woodbury, twp. engr.

N. Y., Andover—Village, Village Hall, plans completed sewerage sys. **$172,776.** Financing provided. William L. Lozier Co., 10 Gibbs St., Rochester, consult. engrs. CD 10/12/44—ENR 11/2/44, under Postwar Projects.

★**N. Y., Binghamton**—City, City Hall, plans under way intercepting sewer, disposal plant, **$2,000,000.** Parsons, Brinckerhoff, Hogan & Macdonald, 142 Maiden Lane, New York, consult. engrs. CD 10/12/44—ENR 11/2/44, under Postwar Projects.

N. Y., Brighton (Sta. Rochester)—Sewer Comn. Dist. 2, Town Hall, plans completed relief sanitary trunk sewers, Elmwood Ave. between Winton Rd. and East Ave., **$86,698.** Westfall Rd. between Edgewood Rd. and Monroe Ave., **$15,687.** Financing provided. William S. Lozier Co., 10 Gibbs St., Rochester, consult. engrs. CD 9/21/44—ENR 10/5/44 under Postwar Projects.

N. Y., Cazenovia—Village, Village Hall, plans under way sewage disposal plant and trunk sewer connection. **$45,650.** Barker & Wheeler, 36 State St., Albany, consult engrs. CD 6/21/44—ENR 6/29/44, under Postwar Projects.

N. Y., Colonie—Town, Town Hall, plans completed sewage treatment plant addns., **$66,125;** sewerage sys., **$153,559.** Financing provided. Keis & Holroyd, 257 Bway., Troy, consult. engr. CD 2/25/44—ENR 3/9/44 under Postwar Projects.

N. Y., East Hills—Village, Village Hall, plans completed storm drainage sys. **$160,768.** Financing provided. A. K. Peloff, 200 Maple Ave., Westbury, consult. engrs. CD 5/22/44—ENR 6/1/44 under Postwar Projects.

N. Y., Freeport — Village, Village Hall, addnl. incinerator and imprv. incinerator plant, **$25,000;** plans completed combination stormwater and cooling water drain from power house to Freeport Brook, **$28,859.** Financing provided. Baldwin & Cornelius Co., 61 Mount Ave., engrs. CD 10/11/44—ENR 11/2/44 under Postwar Projects.

N. Y., Mineola — Comrs., Nassau Co., County Court House, plans under way storm water drain at Locust Valley, **$60,000;** Baldwin Rd., **$40,000;** Pines Brook, West Hempstead, **$90,000;** 1,200 ft. 48 in. rein.-con. pipe drain Tulip Ave., Drew Ave. to Averill Blvd., **$37,000;** 2,500 ft. rein.-con. pipe in existing ditch, Valley Stream Brook No. 1, Garvin Blvd. to Arlington Ave., **$25,000;** storm water drain, Denton Ave. Drain, Sect. 2, **$50,000;** drainage ditch and concrete box culverts, Fosters Brook, Valley Stream, **$100,000;** Sect. 5, Southern Station, parkway to Hempstead Farm Turnpike, **$100,000;** Fosters Brook, Sect. 4, Franklin Square Rd. to Southern State Parkway, **$65,000;** Baldwin Creek, Sect. 1, Merrick Rd. to Foxhurst Rd. **$45,000;** 2600 ft. 36 in. rein.-con pipe, Long Beach Rd. Drain, Rockville Center, **$30,000;** dredging and ditching Bedel Creek, Oceanside, **$25,000;** 12,000 ft. ditching, 4,100 ft. concrete box culverts, 3500 ft. rein.-con. pipe, Horse Brook, West Branch, Garden City, **$156,331;** sanitary sewers, incl. sewage treatment plant and outfall sewer Dist. No. 2, **$9,452,850;** 4,500 ft. 60 in. rein.-con. pipe, Horse Brook, east Branch, Steard Ave. to Old Country Rd., **$125,000;** plans completed drainage and basin, Carle Place, **$117,708;** 5,800 ft. rein.-con. pipe, Uniondale Ave. Drain, Uniondale, **$86,038.** Financing provided. J. C. Guibart, Comr. P. Wks., engr. CD 5/24/44—ENR 6/1/44 under Postwar Projects.

N. Y., Rochester — Comrs., Monroe Co., County Court House, Rochester, plans completed 2.4 mi. storm sewer, Carlisle, Bonesteel and Castleford Sts., in Irondequoit, **$375,000.** Financing provided. F. H. Carroll, Dir. P. Wks., engr. CD 3/31/44—ENR 4/20/44 under Postwar Projects.

N. Y., Spring Valley—Village, Village Hall, plans completed garbage incinerator, **$50,466;** O. G. Asetin, Spring Valley, consult. engr. plans under way sanitary sewers and imprvs., to sewage disposal plant, **$34,730.** T. M. Riddick, 369 E. 149 St., New York, consult. engr. CD 12/21/44—ENR 1/11/45 under Postwar Projects.

N. Y., Watertown—City, City Hall, plans completed, sewers and reconstructing old sewers, **$213,040.** Financing provided. Field, Emerson & Morgan, Watertown, consult. engrs.

N. Y., Watertown—City, D. Coleman, Dir. P. Wks., City Hall, plans completed storm water sewers, **$50,000.** Financing provided. CD 3/31/44—ENR 4/20/44, under Postwar Projects.

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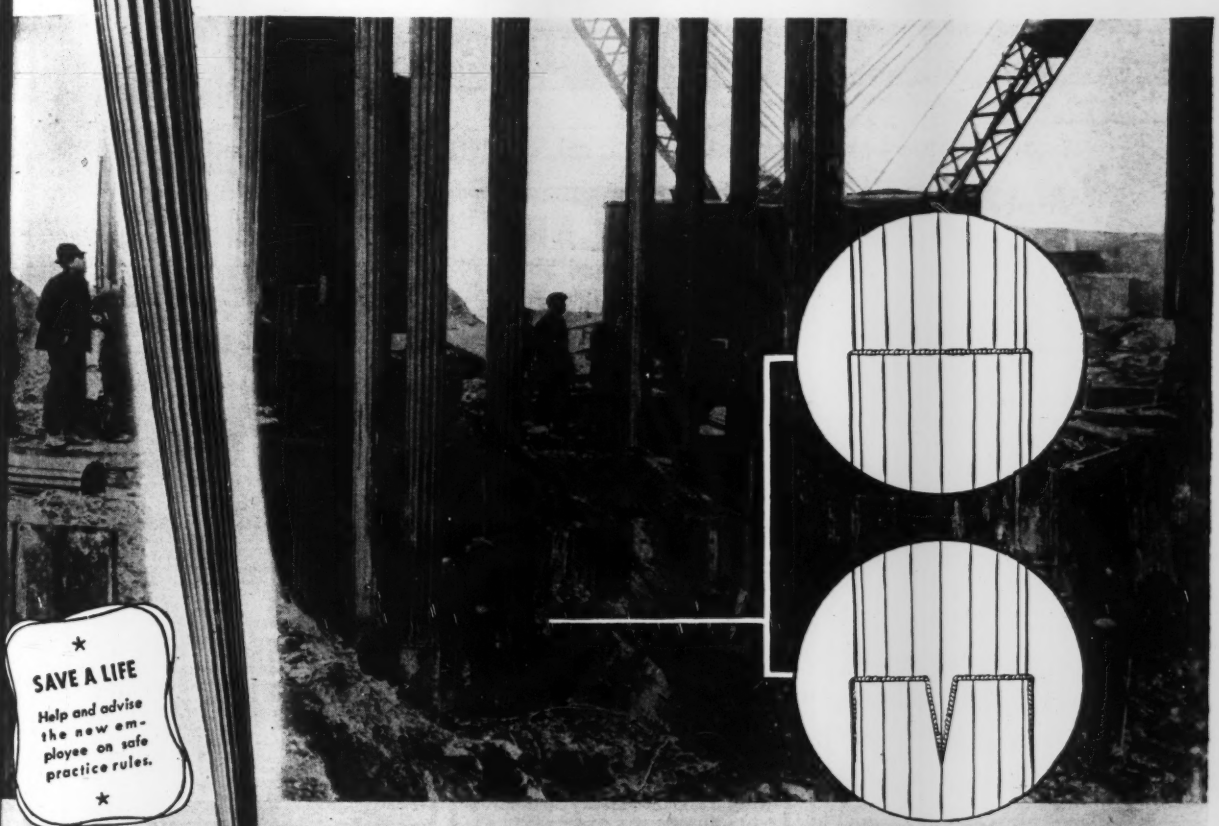

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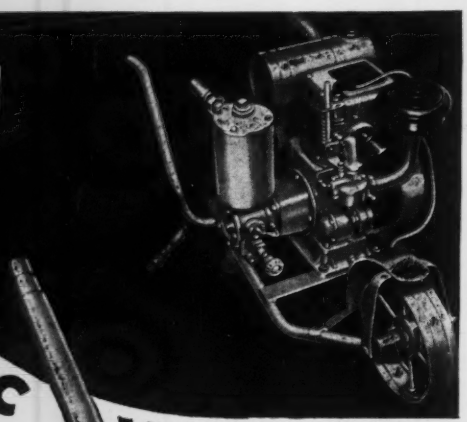

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SEWERS, etc. (Proposed Work, Cont'd.)

N. Y., Wellsville—Village, Village Hall, plans completed storm water drainage system, **$49,495.** Financing provided. R. C. Hoard, Wellsville, consult. engr. CD 3/19—ENR 4/5. under Postwar Projects.

N. D., Mandan—City, City Hall, **$126,5**, bond election Jan. 3, exten., improv. storm sewerage sys. Black & Veatch, 4706 Bway., Kansas City, Mo., consult. engrs. CD 2/7—ENR 2/22, under Postwar Projects.

O., Portsmouth—City, City Hall, sewer exten. program, **$63,000;** sanitary sewer project, **$33,300.** C. Zeune, Municipal Bldg., acting city engr. CD 11/5—ENR 11/23.

Okla., Edmond — City, D. W. Banzet, mayor, City Hall, plans 10% complete exten. storm sewerage sys., **$25,000;** exten. improv. sanitary sewerage sys., **$60,000.** Bonds voted. C. W. James, Britton, consult. engr. Flora Jefferies, city clk. CD 11/27.

Okla., Goodwell—W. W. Groom, mayor, City Hall, sewerage sys. **$20,000.** Alexander & Pollard, 414 Terminal Bldg., Oklahoma City, consult. engrs.

Okla., Langston—Bd. Affairs, Capitol, Oklahoma City, sewage disposal plant, Colored A & M College. **$54,200.** Financing provided. P. Smith, Oklahoma City, engr. CD 11/2

★**Okla., Oklahoma City**—City, voted **$1,450,000** bonds, exten. storm sewerage sys. R. Lee, Jr., City Hall, city engr. CD 9/2—ENR 9/13.

★**Okla., Oklahoma City**—Voted **$9,000,000** bonds, addns. to sewage disposal plant and addnl. sanitary sewer mains. W. L. Benham, American National Bank Bldg., engr. CD 10/9—ENR 11/15.

Okla., Vinita—Chas. Teenor, Jr., mayor, City Hall, storm sewers. **$400,000.** W. B. Holway & Associates, 302 E. 18 St., Tulsa, consult. engrs.

Okla., Woodward—City, City Hall, voted **$39,000** bonds, exten. storm sewerage sys. **$90,000** bonds, sewage disposal plant, sanitary sewer extens. Alexander & Pollard, Terminal Bldg., Oklahoma City, consult. engrs. CD 11/12.

Ore., West Linn—City, M. Wilson, mayor, City Hall, primary sewage treatment units for 7 trunk lines or central disposal plant. Over **$25,000.** Financing not provided.

Pa., Bellevue—Otto's Suburban Dairy, Inc., B. F. Otto, vice-pres. and general mgr., Bellevue, industrial waste treatment plant, Killbuck Twp.

Pa., Canton—Rosedale Dairy Co., Inc., 6 Minnequa Ave., J. T. Burlingame, mgr., Canton, industrial waste treatment plant.

Pa., Carnegie—Superior Steel Co., D. Pryde, vice-pres., Carnegie, industrial waste treatment plant, Scott Twp.

Pa., Clymer—Boro, Boro Hall, sewage disposal plant. **$125,000.** Financing not provided. T. Pealor, Indiana, engr.

Pa., Edgewood (br. Pittsburgh)—Boro of Edgewood, sewage disposal plant, **$50,000.** Financing not provided. M. Knowles Inc., Park Bldg., Pittsburgh, consult. engr. CD 10/31—ENR 11/29.

Pa., Freeport—Boro, Boro Hall, sewage disposal plant. **$25,000.** Chester Engineers, Inc., Parkway, N.S., Pittsburgh, consult. engrs. CD 2/7—ENR 2/22, under Postwar Projects.

Pa., Greentree—Greentree Boro, Boro Hall, sewage pump. stations, sewers. **$250,000.** J. F. Triggs, Berger Bldg., Pittsburgh, consult. engr. CD 12/10—ENR 12/27.

Pa., Indiana—Boro, Boro Hall, sewage disposal plant. **$45,000.** T. Pealor, Indiana, consult. engr. CD 2/7—ENR 2/22, under Postwar Projects.

Pa., Sergeant—Otto Chemical Co., J. H. Heim, genl. supt., Sergeant, industrial waste treatment plant, Wetmore Twp.

Pa., Tatesville—Pittsburgh Silica Sand Co., 2009 Clark Bldg., Liberty Ave. at 7 St., Pittsburgh, T. MacConnell, Jr., pres., industrial waste treatment plant, W. Providence Twp., near here.

★**Pa., Upper Darby**—Upper Darby Twp., Municipal Bldg., sewers various locations, throughout township. **$1,500,000.**

Pa., Woolrich—Woolrich Woolen Mills, E. C. Tobias, genl. mgr., Woolrich, industrial waste treatment plant, Pine Creek Twp.

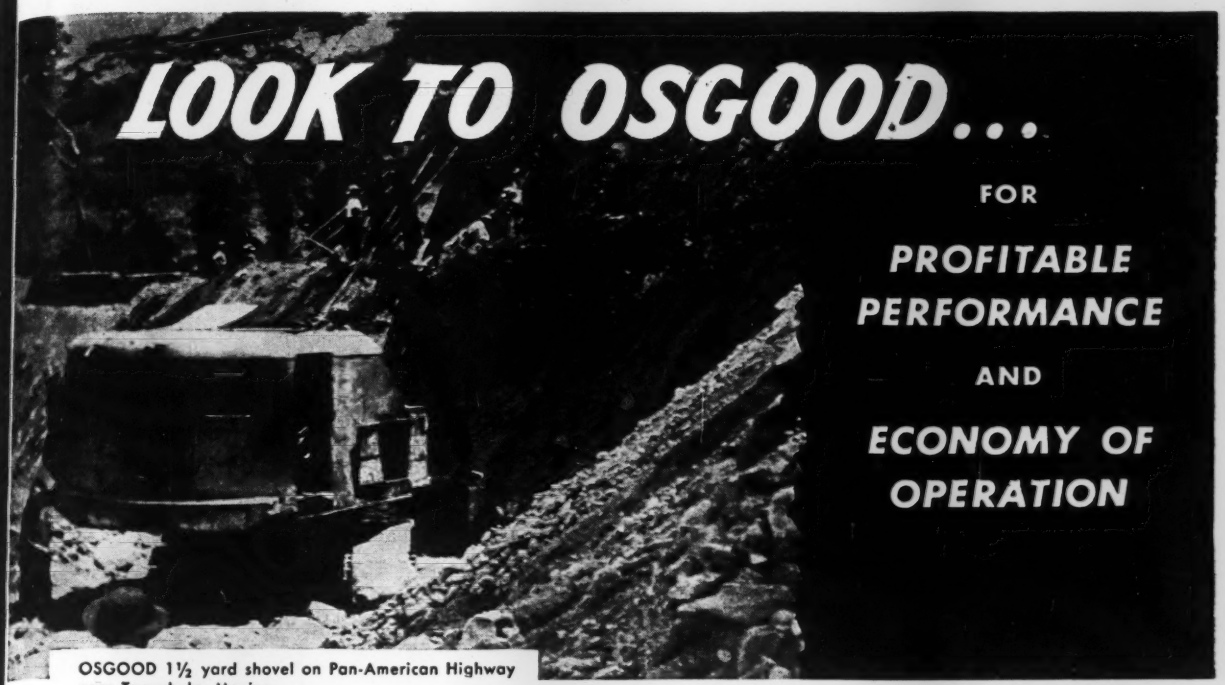
S. D., Iona—City, sewers and imhoff tank. **$50,000.** Financing not provided. A. S. Mannes, Aberdeen, consult. engr.

S. D., Rosholt—City, sewage disposal plant. **$75,000.** Financing not provided. A. S. Mannes, Aberdeen, consult. engr. CD 7/21/43—ENR 7/29/43, under Postwar Projects.

Tex., Boerne—City, City Hall, plans 20% completed sanitary sewers **$100,000.** Financing provided. Austin Engrg. Co., 203 Riverside Dr., Austin, consult. engr. CD 10/23—ENR 11/15.

★**Tex., Dallas**—City, City Hall, voted bonds, sanitary sewer lines, facilities, **$2,100,000;** storm sewers, **$2,800,000.** CD 11/5—ENR 11/29.

Tex., Galveston—City, G. W. Frazer, mayor, City Hall, voted bonds, sanitary sewer lines. **$83,000.** P. A. Milligan, City Hall, engr. CD 10/25—ENR 11/15.



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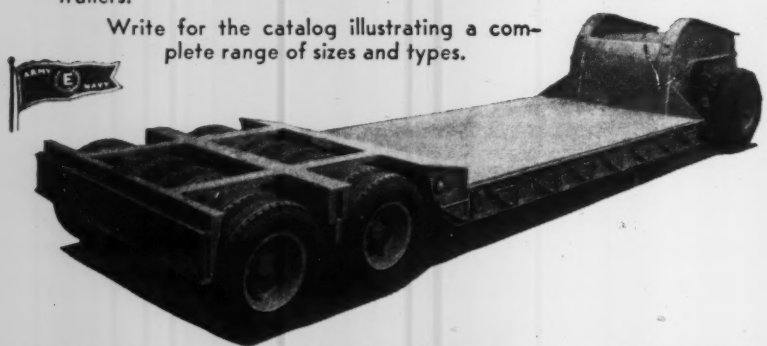

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SEWERS (Proposed Work Cont'd.)

★**Tex., Houston**—City, City Hall, ...dge lines from South and North Sid... treatment plants to Lagoon near Ship ... Channel, $175,000; sanitary sewer lines on R... Olson St., $335,000; exten. South Side tru... line westward to Harris Gully, $500,000; on ...ing-hurst St., $300,000; miscellaneous ... sanitary sewer lines, $117,000; S... sewers, Lockwood Dr., $300,000. Fi... provided. G. L. Fugate, City Hall, eng... CD 11/22/44—ENR 12/14/44 under Postwa... Projects.

★**Tex., Houston**—City, City Hall, ...storm sewers, Marlborough Dr. Sys., $... 2nd unit Kirby Drive Sys., $350,000; ... Park Sys., $160,000. Financing pro... G. L. Fugate, City Hall, city engr.

Tex., Houston—F. B. Whitehead, ...al, 2248 Swift St., sanitary sewer line, $... Financing provided. R. Moehlman, City Hall, engr.

Tex., San Angelo—City, S. Lawhon, engr., City Hall, plans 50% completed 18 in. sanitary sewers from Magdalen to Bell Sts., $28,200; plans 25% completed 6 and ... in. lateral sanitary sewer lines, $60,000; storm sewers, 14, 5, 7 and Volney Sts., $60,000; plans 10% completed expan. sewage disposal plant, $30,000. Financing provided. J. P. Burden, City Hall, city engr.

Tex., San Antonio—Travis-Soledad Corp. & Assoc., Travis Bldg., plans 50% completed sanitary sewers. $30,000. Financing provided.

Tex., Seymour—C. M. Randal, mayor, City Hall, storm sewers, $117,000; sewer addns., sewer lines, $125,000. J. E. Ward, Allison-Dunan Bldg., Wichita Falls, consult. engr.

Wash., Clarkston—City, City Hall, disposal plant, conversion of sew. sys. $76,000. Financing not provided. R. H. Corey, Corbett Bldg., Portland, Ore., consult. engr.

Wash., Okanogan—City, City Hall, plans under way, sewerage sys., disposal plant, $200,000. Financing not provided. W. L. Malony, Symons Bldg., Spokane, consult. engr. CD 7/30—ENR 8/9, under Postwar Projects.

★**W. Va., Clarksburg**—City, City Hall, sewage disposal plant, extending and enlarging sanitary sewer sys. with interceptors disposal plant and outfall sewers, $1,000,000. The Chester Engineers, 210 E. Parkway, N. W., Pittsburgh, Pa., engrs. CD 8/6—ENR 8/23, under Postwar Projects.

Wis., Dresser—City, C. R. Thye, clk., sanitary sewers, sewage treatment plant, $73,732. Banister Engrg. Co., 1547 University Ave., St. Paul, consult. engr. CD 11/21.

Wis., Wrightstown—Village, M. E. Hardy, clk., sanitary sewers, sewage treatment plant. $65,500.

N. B., East Bathurst—Municipality, sewerage sys. $35,000.

Ont., Acton—Town of Acton, C. F. Leatherland, clk., voted $184,000 bonds for sewage disposal plant. Armstrong Anderson & Co., Temple Bldg., Toronto, engrs. CD 11/21—ENR 12/13.

Ont., Belleville — Municipality, defeated $367,000 bonds for sewage disposal plant. C. A. Mott, City Hall, engr. CD 11/14—ENR 12/13.

Ont., Brantford—City, E. J. Campbell, clk., voted $64,000 bonds for sewer development. G. H. Richards, engr. CD 10/24—ENR 11/15.

Ont., Dundas—Town, C. F. Nunn, storm drains and treatment plant extens., $250,600. G. G. Reid, 264 Avenue Rd., Toronto, engr.

Ont., Hearst—Municipality, E. Cherrier, clk., sewerage sys. $40,000. G. G. Reid, 7 Edmund Ave., Toronto, engr.

Ont., Kingsville — Municipality, W. G. Long, clk., Kingsville, drainage project. $30,000. C. G. R. Armstrong, 606 Bartlett Bldg., Windsor, engr.

★**Ont., Niagara Falls**—Municipality, voted $563,033 bonds, for sewers. W. S. Orr, City Hall, engr. CD 11/16—ENR 12/13.

Ont., Port Stanley—Village, J. Burke, clk., sewerage sys. About $100,000 or more. CD 7/20—ENR 8/2.

Ont., Toronto—East York Twp., c/o W. H. Heaton, clk., 443 Sammon Ave., sewers in Dawes Rd. area. $30,000. J. D. Corcoran, 443 Sammon Ave., Toronto, comr. Works and engr.

Ont., Welland—City, J. D. Watt, clk., voted $75,000 bonds for incinerator. C. L. Coulson, city engr. CD 11/12—ENR 11/29.

Que., Lewis—City, J. A. Begin, mayor, incinerator, $45,000.

BRIDGES

PROPOSED WORK

Calif., Bakersfield—City, plans completed Sonora St. overhead, between E. 21 and Kentucky Sts. $229,500. J. Holjelder, City Hall, engr.

★**Calif., Los Angeles**—Los Angeles Co., Hall of Records, bridges, approaches over Los Angeles River on Florence Ave. $372,332; over Santa Clara River & S. P. R. R., on Soledad Canyon Rd., $200,000; over San Gabriel River on San Gabriel Canyon Rd.

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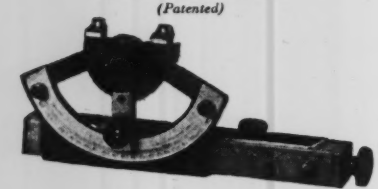

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BRIDGES. (Proposed Work, Cont'd.)

(E. Fork) **$280,000.** O. F. Cooley, Hall of Records, road com.

★ **Calif., Los Angeles**—Los Angeles County, Hall of Records, bridge and approaches in Valley Blvd. over San Gabriel River, **$432,000,** Arrow Highway over Little Dalton Wash., **$135,000,** Arrow Highway over Santa Anita Wash., **$100,000,** Orangethorpe Ave. over Coyote Creek, **$400,000.** O. F. Cooley, Hall of Records, Road Com.

Ill., Tuscola — Douglas Co., Courthouse, rein.-con. bridges over Embarrass River, **$35,000;** over Scattering Fork, **$20,000;** over Hackett Branch, **$10,000.** T. O. Timm, co. supt. hys.

La., New Orleans—City, City Hall, plans under way constructing underpass at Southern Railway Crossing at Gentilly Road and Brunells St. **$440,000.** N. L. Marx, City Hall, city engr.

★ **Mass., Salem**—Comm. of Mass. Dpt. of P. Wks., R. W. Coburn, chief eng., 100 Nashua St., Boston, plans concrete and steel railroad crossing overpass, Bridge St. Est. **$500,000.** Financing provided.

Missouri—State Hy. Comn., Jefferson City, plans 90% completed, two 8 ft. rein.-con. slab span, culvert type bridge over Branch, on road from Route SAA-Southeast to Route SW; one 49 ft., two 35 ft. I-beam spans, 2 concrete bents to rock, 2 steel pile bents, on road from Route SAA south, Route SK-Proj. FAS 82 (2); two 12 ft. rein.-con. slab span, culvert type bridge over West Branch of Hickory Creek, Rte. SK-Proj.-FAS 82 (2), on road from SAA southeast to Route SW, all foregoing in Audrian Co.; one 60 ft. four 29 ft. I-beam spans, 2 concrete bents to rock, 4 con. pile bents over Middle Fabins River, road from Baring east, Rte. SK-Rwy.-S823 (3) Knox Co. Each under **$25,000.** C. W. Brown, Jefferson City, ch. engr.

Missouri—State Hy. Comn., Jefferson City, plans 90% completed two 7 ft. rein.-con. slab span, culvert type bridge over stream; two 8 in. rein.-con. slab span, culvert type bridge over stream; two 6 ft. rein.-con. slab span, culvert type bridge over stream; one 27 ft. and two 22 ft. rein.-con. slab span bridge, concrete bents to rock over Matthes Creek; two 10 ft. rein.-con. slab span bridge over Mitchell Creek; three 40 ft. rein.-con. deck girder span bridge concrete bents to rock, over Cedar Creek, all Route ST-Proj. S-728 (2), Madison Co. Each under **$25,000.** C. W. Brown, ch. engr.

Neb., Grand Island—City, F. White, clk., City Hall, underpass or overpass at UPP. RR Co. tracks and resurfacing Second St., part of US Hy. 30, passing through here. **$200,000.** W. G. Scott, state hy. engr.

★ **New Jersey and Pennsylvania**—Delaware River Joint Toll Bridge Comn., Trenton, N. J., bridges at Milford, N. J. **$1,100,000;** Flatbrookville, N. J., **$1,500,000;** plans completed repairing bridge over Delaware River, between Trenton, N. J. and Morrisville, Pa., **$60,000;** repairing base pier bridge, Milford, Pa., **$25,000;** imprv. floor of bridge, Frenchtown, N. J., **$65,000** Financing not provided. New Jersey State Engrg. Dpt., Trenton, engr.

N. J., Cape May Court House—Bd. Freeholders, Cape May Co., Cape May Court House, plans completed, reconstructing Corson's Inlet and Middle Thoroughfare Bridges, **$45,000.** Financing not provided. R. A. Sharp, Cape May Court House, co. engr.

★ **N. J., Freehold**—Bd. Freeholders Monmouth Co., Freehold, concrete trestle Bridge No. E-18 at Ft. Monmouth-Little Silver, **$74,200;** steel, concrete bascule drawbridge, No. S-32, Sea Bright, **$535,000.** Financing not provided. O. R. Seaman, co. engr.

N. Y., Binghamton—Comrs., Broome Co., Court House, Binghamton, highway bridge No. 1, C. R. 31, at Lisle, **$100,000;** No. 5, West Franklin Rd., Union, **$55,000;** No. 4, Mill St., Deposit, **$55,000.** Financing provided. J. B. Orr, 250 Robinson St., Binghamton, co. hy. supt. CD 10/25/44—ENR 11/16/44, under Postwar Projects.

N. Y., Fonda—Comrs., Montgomery Co., Fonda, plans completed, highway bridge No. 15, County Rd. 116, **$6,500;** bridge 14, Co. Rd. 60, **$3,532;** bridge 13, Co. Rd. 120, **$8,000;** bridge 12, Co. Rd. 40, **$3,892;** bridge 11, Co. Rd. 91, **$8,500;** bridge 10, Hagaman, **$13,200;** bridge 9, Co. Rd. 38, **$6,000;** bridge 8, Co. Rd. 11, **$9,000;** bridge 7, Co. Rd. 35, **$6,500;** bridge 6, Co. Rd. 33, **$4,500;** bridge 5, Wagner Hollow Rd., **$18,800;** bridge 4, Wagner Hollow Rd., **$29,500;** bridge 2, town hy. at Browns Hollow, **$6,495.** Financing provided. L. H. M. Whitney, Court House, co. engr. CD 10/25/44—ENR 11/2/44, under Postwar Projects.

N. Y., Geneseo—Comrs. Livingston Co., Geneseo, plans completed replacing bridges 27, 37 and 50, **$47,885;** plans under way 10x8 ft. concrete culvert, 200 ft. long with embankment replacing bridge, County Rd. 42, crossing over Raynolds Gulf, **$56,400.** Financing provided. G. C. Webster, Conesus, co. supt. hys.

N. Y., Little Valley—Comrs., Cattaraugus Co., Little Valley, plans completed county line highway bridge, town of Yorkshire, **$49,000.** Financing provided. H. E. Edmonds, co. hy. supt.

N. Y., Mineola — Comrs., Nassau Co., County Court House, Mineola, plans under way 10,400 ft. concrete box culvert, 600 ft. box culvert under highway crossing Hempstead Brook, Sect. 1 and 2, Merrick Rd. [illegible] water, **$175,000.** J. C. Guibart, County Engr. Wks., engr.

★ **N. Y., Mineola**—Comrs., Nassau Co., County Court House, plans under way highway bridge at Long Beach, **$700,000.** J. E. Greiner Co., 1201 St. Paul St., Baltimore, Md., consult. engr.; plans completed highway bridge at Park Ave. bridge, Hicksville Center, **$20,041;** highway bridge at Bay View Ave. Bridge, Bay View, **$295,000.** A. B. Cohen, 1 Madison Ave., New York, consult. engr. Financing provided. CD 11/13/44—ENR 11/30/44 under Postwar Projects.

N. Y., Poughkeepsie—Comrs., Dutchess Co., County Court House, plans completed highway bridge S-13, at Lafayetteville, **$13,222;** W-24-32 at Shady Dell, **$64,300;** S-28, Creamery Rd., **$16,065.** Financing provided. C. H. O'Brien, Court House, deputy co. supt. of hys. CD 3/31/44—ENR 4/20/44, under Postwar Projects.

N. Y., Rochester — Comrs., Monroe Co., Court House, Rochester, plans completed highway bridge at Union St., **$43,200;** Cheese Factory Rd., **$43,300;** Redman Rd., **$33,700;** Lake Rd., East Fork, **$33,759;** North Hamilton Rd., **$51,000;** Wheatland Center Rd., **$31,000;** Bowerman Rd., **$41,300;** Hamilton-Parma T.L. Rd., **$20,100;** Ballantine-Aseger Rd., **$41,600.** Financing provided. F. H. Carroll, Div. P. Wks., engr. CD 5/22/44—ENR 6/1/44 under Postwar Projects.

N. Y., Wampsville—Comrs., Madison Co., Wampsville, plans completed highway bridge, Brookfield, **$10,300;** Talley Rd. bridge, **$9,300;** Palmer Rd. bridge, **$74,000;** South Brookfield bridge, **$13,150;** West Beaver Creek Bridge, **$13,150;** Yeaw Bridge, **$22,100;** Skeaneateles Turnpike Bridge, **$21,250;** Canning Factory bridge, Cazenovia, **$11,200;** Eaton Village Bridge, Eaton, **$7,650;** Vail Rd. bridge, Cazenovia, **$6,650;** Coon Rd. Bridge, Cazenovia, **$10,200;** Ballina Bridge, Cazenovia, **$10,600;** Burr St. bridge, Cazenovia, **$13,250;** Stanton Rd. bridge, Deruyter, **$7,300;** Bastian Bridge, **$6,050;** Bierceville Bridge, both in Eaton, **$4,850;** Cary St. bridge, Eaton, **$9,150;** Wickwire Rd. bridge, Hartland, **$8,800;** Glass Factory Rd. bridge, Southfield, **$8,000;** Swallow Rd. bridge, Oneida, **$25,550;** South Rd. bridge, **$7,550;** Allen Hill Rd., Eaton, **$9,150;** Bingley Bridge, Fener, **$10,300;** Milk factory bridge, Hamilton, **$8,800;** South Hamilton Bridge, Hamilton, **$10,000;** Devering Rd. bridge, **$8,650;** Olmstead Bridge, **$11,700;** Osborne Bridge, Sullivan, **$6,700;** Falls Bridge, Stockbridge, **$5,900;** Water St. Bridge, Madison, **$8,750;** North Main St. Bridge, Lenox, **$16,000;** Sullivan Creek Bridge, Sullivan, **$10,250;** Milk Factory Bridge, Lebanon, **$5,350;** South Lebanon Bridge, **$6,300;** Randallsville Bridge, **$10,400;** Chase Rd. Bridge, **$14,150;** Gravel Bed Bridge, **$7,650;** Lebanon Depot Bridge, **$5,650;** all foregoing in Lebanon; Kelly Rd. Bridge, Hamilton, **$10,950.** Financing provided. L. H. Johnson, co. supt. hys., Linley Corp., 216 Cottage Place, Oneida, consult. engr. CD 4/7/44—ENR 4/20/44.

North Dakota—Clay Co., Minn., W. D. Johnson, aud., Moorhead, Minn., and Cass Co., Fargo, N. D., steel, concrete bridge over Red River of the North, Saunders, N. D., **$50,000;** bridge over Red River of the North about 1 mi. south of Wild Rice, N. D., **$50,000.** H. R. Grove, Moorhead, Minn., co. hy. engr. D. B. Spaulding, Fargo, co. surv.

O., Norwood—City, City Hall, grade crossing elimination project with Norfolk & Western R.R. on Montgomery Rd. **$150,000.** J. G. Schmidt, Municipal Bldg., city engr.

Oklahoma — State Hy. Dpt., Oklahoma City, bridge over Poteau River on U. S. Hy. 270, near Howe, LeFlore Co., **$75,000;** bridge over North Canadian River north of Aline, Alfalfa Co., **$45,000.** Financing not provided. H. E. Bailey, Oklahoma City, engr.

Tex., Houston—Comrs. Harris Co., Court House, plans 15% completed vehicle bridge over Buffalo Bayou. **$250,000.** Financing provided. Howe & Wise, Stewart Bldg., consult. engr. H. Zapp, c/o Court House, engr.

Wis., Burlington — Racine Co., Racine, bridge across Fox River, at Bellewood. **$45,000.** E. R. Fischer, Court House, Racine, engr.

Alta., Edmonton—Municipality, replacing steel bridge across North Saskatchewan River with concrete bridge, **$130,000;** replacing steel bridge at Groat River with concrete bridge, **$120,000.** CD 11/8/43—ENR 11/11/44 under Postwar Projects.

Ont., Sarnia—Lambton Co., Sarnia, boundary bridge. **$25,000.** J. C. Monteith, County Bldg., engr.

Ont., Simcoe—Lake Erie & Northern R.R., F. H. Midgely, asst. engr., Preston, bridge, Argyll St. **$50,000.**

Que., Joliette—City and Canadian National Ry., B. Wheelwright, ch. engr., 360 McGill St., Montreal, overhead bridge across tracks near St. Marks St. **$300,000.** E. H. Lippe, city engr.

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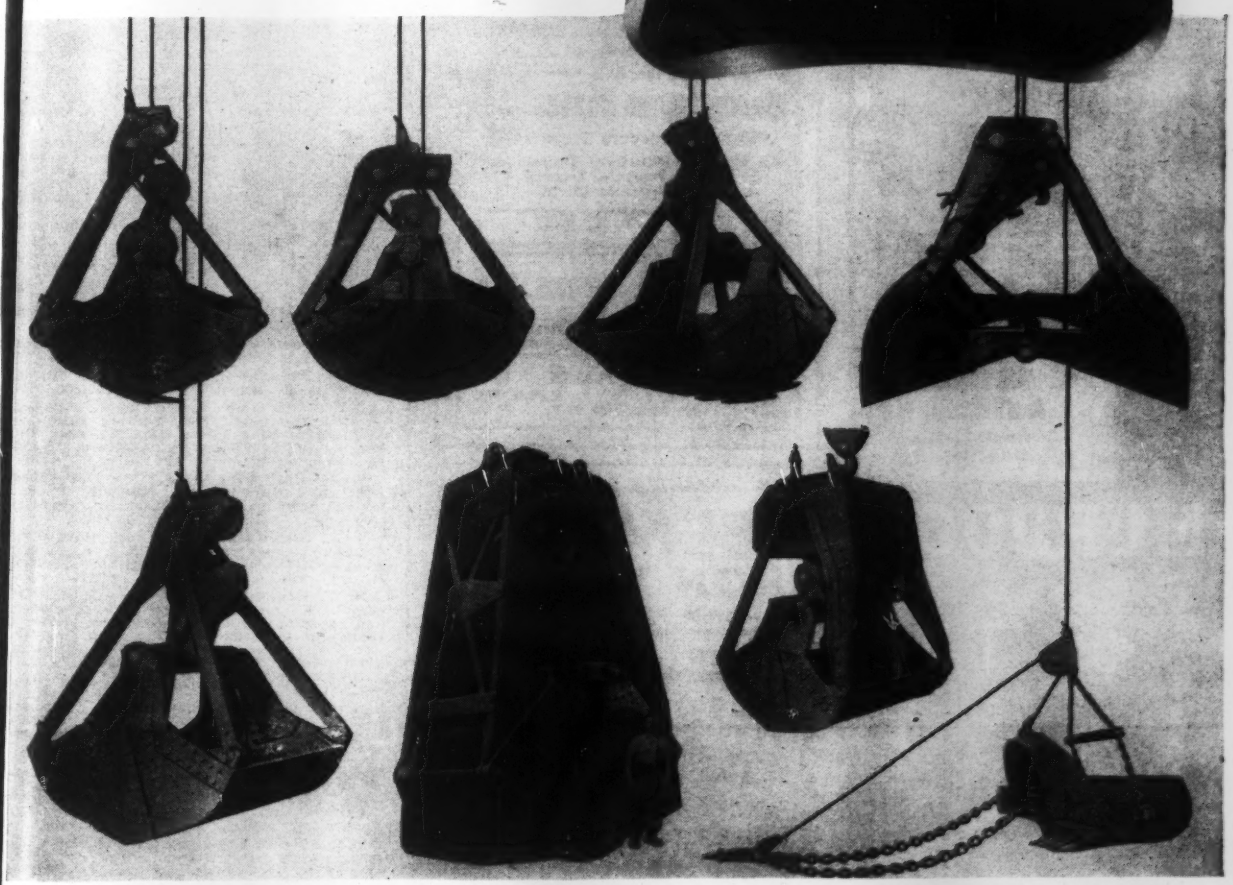

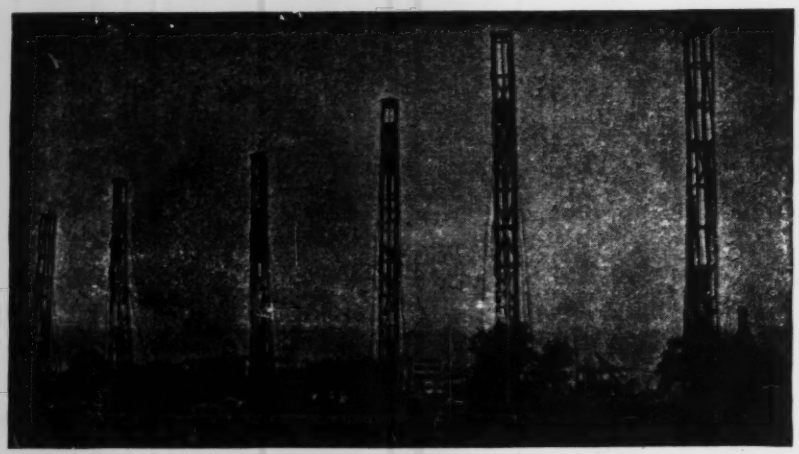

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STREETS AND ROADS

PROPOSED WORK

Ariz., Mesa—City, J. Edwin Miller, city City Hall, plans completed, grading, paving, curb and gutters, realigning water, sewer, gas services, etc., northwest section of city, $65,900. Financing provided. E. H. Tucker, City Hall, city engr.

Ariz., Yuma—City, City Hall, plans completed, paving 7 Ave., incl. curbs, gutters, sidewalks between 12 and 16 Sts. $28,12 Financing provided. C. O. Gilliam, City Hall, engr.

Ark., Cotter—B. R. Pratt, mayor, street paving. $50,767. M. L. Crist & Associates, Union Life Bldg., Little Rock, consulting engrs.

Ark., Forrest City—St. Francis Co., Forrest City, hardsurfacing, mail routes, school bus routes, farm-to-market roads. $200,000

Ark., Rison—J. H. Yancey, mayor, plans completed, street paving. $83,500. E. G. Hampton, Fordyce, consult. engr.

Calif., Bakersfield—City, plans complete resurfacing Chester Ave. between Terra Way and 8 St. $70,000. J. Holjelder, City Hall engr.

Calif., Hawthorne—City, 190 N. Hawthorne Blvd., plans completed imprv. streets, widening curbs and pavements, gutters, drainage structures, $71,000. C. M. Lengel, asst. city engr.

Calif., Inglewood—City, City Hall, plans completed street imprvs. Centinela Ave. between Freeman and Inglewood Aves. $40,000. W. E. Kennedy, city engr.

★ **Calif., Jackson**—Amador Co., Courthouse, Jackson, road from Pioneer Station to West Point, $460,000; road from Plymouth to Cosumnes River. $210,000.

Calif., Montebello—City, plans completed rebuilding streets, $54,000. J. L. Cole, city engr.

★ **Calif., San Andreas**—County of Calaveras, Court House, 7 mi. widen and new construction, Copperopolis to O'Brynes Ferry, $100,000; 22 mi. Highway 8 to Jenny Lind, Milton & Copperopolis, $150,000; 14 mi. Highway 12 to Goodman's corner to Camanche, Campo Seco & Valley Springs, $100,000; 12 mi. Mountain Ranch to Railroad Flat, $100,000; 7 mi Mountain Ranch to Sheep Ranch, $100,000; 12 mi. San Andreas to Fricot City via Calaveritas, $150,000; 5 mi. Vallecito to Stanislaus River, $50,000; 4 mi. West Point to Amador Co. Line, $80,000. O. C. Wylie, city engr.

Calif., Santa Rosa—City, City Hall, street imprvs. $175,000. Bonds voted. CD 11/12—ENR 11/29.

Calif., South Pasadena—City, City Hall, imprv. Meridian St. $40,000. F. H. Clough, city engr.

Ill., Tuscola — Douglas Co., Courthouse, gravel or stone surfacing 3 mi. Route 8, $45,500; gravel or stone surfacing, grading, drainage 5 mi. Route 7, $52,000; 4.5 mi. Route 17, $7,500; 2.75 mi. Route 10, $55,250; concrete paving, grading, drainage, 1.5 mi. Route 5, $35,000. T. O. Timm, co. supt. hgs.

Mass., Leominster — City, Mayor's Office, City Hall, 15 mi. sidewalks. $100,000. Wm. P. Pray, 30 S. Cotton St., consult engr. CD 8/23/44—ENR 9/7/44, under Postwar Projects.

Minn., Aitkin—City, City Hall, street imprvs. $97,200.

Miss., Forest—City, City Hall, approx. 4.2 mi. street imprvs. $136,000.

Miss., Prentiss—City, City Hall, approx. 20,000 lin. ft. street imprvs. $151,500.

★ †**Montana**—Pub. Roads Admin., P.O. Box 3900, Portland, Ore., grading, surfacing Libby-State Line Forest Hy. $175,000; Yellowstone Trail Forest Hy., $524,000. W. H. Lynch, div. engr.

N. J., Burlington—City, City Hall, plans under way street imprvs. $350,000. Financing not provided. S. H. Probasco, City Hall, city engr.

N. J., Edgewater—Boro, Boro Hall, plans completed repaving Undercliff Ave., Sect. 1, 2, 3, 4, 5, $32,500. Financing not provided. R. Gaul, asst. boro engr.

N. J., Edgewater—Boro, Boro Hall, plans completed, removing present steel viaduct and constructing highway at new grade on Undercliff Ave., from south side of Dempsey Ave. to Hudson Ave., $50,000. Financing not provided. R. Gaul, asst. boro engr.

N. J., Freehold—Bd. Freeholders, Monmouth Co., Freehold, hy. connecting C. R. 11 and Port-on-Peck Ave., $74,200 and hy. connecting C. R. 11 and Comanche Dr., $69,000, both Oceanport Boro. Financing not provided. O. R. Seaman, co. engr.

★ **N. J., Hamilton**—Town, Town Hall, plans under way 20 mi. 8 in. macadam pavement, various roads and streets. $1,000,000. Financing not provided. A. E. Riley, 2090 Greenwood Ave., Hamilton, engr.

N. J., Montclair—Town, Hall, plans under way, paving, curbing, storm drains, Hillside Ave., Orange Rd. to South Mountain Ave., $18,500; Sect. 1, Harrison Ave., Union

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6″ Triple	2000 lbs.	2750 lbs.
7″ Single	1500 lbs.	1700 lbs.
7″ Double	2000 lbs.	2580 lbs.
7″ Triple	2500 lbs.	3000 lbs.
8″ Single	1700 lbs.	2200 lbs.
8″ Double	2450 lbs.	2850 lbs.
8″ Triple	3200 lbs.	3500 lbs.
10″ Single	2600 lbs.	2700 lbs.
10″ Double	3400 lbs.	3650 lbs.
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STREETS, etc. (Proposed Work, Cont'd.)

St. to Oak Place, **$39,000**; Sect. 2, Oak Place to West Orange Line, **$46,000**; Alexander Ave., Grove St. to Valley Rd., **$32,500**; Myrtle Ave., Trinity Place to South Mountain Ave., **$28,000**; various streets, **$27,300**. Financing not provided. F. M. Galloway, supt. P. Wks., engr. CD 4/21/44—ENR 5/4/44, under Postwar Projects.

N. J., Newton—Sussex Co.,, reconstructing approx. 50 mi. rural roads and streets. **$141,783.** Financing not provided. H. Snook, co. engr.

N. J., Paulsboro—Boro bituminous surfacing, road construction, Proj. No. 1-28-P-207, **$56,475**; 49,000 ft. concrete guttering, 25,000 ft. concrete curbing, various streets, Proj. L-28-P-208, **$69,000.** W. A. K. Conover, 8 N. Broad St., Woodbury, boro engr.

N. J., Titusville—Hopewell Twp., Titusville, plans completed imprv. 1½ mi. roads, **$40,000.** Financing not provided. C. Elden Jaynes, National Bank Bldg., Hopewell, consult. engr. CD 11/1—ENR 11/29.

N. J., Williamstown — Monroe Twp., Municipal Bldg., concrete gutters, 8 mi. various streets, Proj. 1-28-P-203. **$55,500.** Financing not provided W. A. K. Conover, 8 N. Broad St., Woodbury, Twp. engr.

N. Y., Amsterdam—City, City Hall, plans completed paving Minaville St., on Route 30, **$50,772.** Financing provided. C. D. Peterson, City Hall, city engr. CD 4/7/44—ENR 4/20/44, under Postwar Projects.

N. Y., Cortland—City, City Hall, plans completed street paving over existing dirt streets **$85,370.** Financing provided. A. R. Reilly, City Hall, city engr. CD 3/22/44—ENR 6/1/44 under Postwar Projects.

N. Y., Cortland—Comrs., Cortland Co., Court House, plans completed repaving Main St., Preble, **$45,000**; Pitcher St., Cincinnatus, **$22,478**; Main St., Blodgett Mills, **$13,982.** Financing provided. W. J. Dwyer, Court House, co. supt. hys. CD 11/21/44—12/14/44, under Postwar Projects.

N. Y., Freeport—Village, Freeport, plans under way bituminous and concrete pavement 7 mi. dirt streets. **$200,000.** Baldwin & Cornelius Co., 61 Mount Ave., Freeport, engrs. CD 8/17—ENR 9/6, under Postwar Projects.

N. Y., Herkimer—Comrs., Herkimer Co., County Office Bldg., Herkimer, plans completed macadam paving 1.4 mi. Little Lakes to Otsego Co. Line, Warren, **$24,300**; 8 mi. Hinckley-Grant-Ohio, Russia and Ohio, **$58,200**; 1 mi. Gilligan Rd., Russia, **$24,200**; 1.6 mi. Eatonville Rd., Little Falls, **$27,501**; 2.4 mi. Parkers Rd., Litchfield, **$52,400**; 1.4 mi. Indian Castle to Montgomery Co. Line, **$24,139**; 1.5 mi. Smalls Bush Rd., Herkimer, **$32,998**; 1.6 mi. Montz Rd., German Flatts and Warren, **$44,100**; 0.4 Hinman Rd., German Flatts, **$6,668**; 1 mi. Fern Cliff Rd., German Flatts, **$20,028**; 0.8 mi. Merry Rd., Frankfort, **$15,100**; 1.2 mi. Millers Mills-Mills, Columbia, **$27,700**; Chepatchet to Otsego County Line, **$15,981.** Financing provided. A. M. Kennedy, County Office Bldg., Herkimer, engr. CD 3/31/44—ENR 4/20/44, under Postwar Projects.

N. Y., Mineola — Comrs., Nassau Co., County Court House, Mineola, plans under way highway pavement, Merrick Rd., Long Beach Rd., to Baldwin Rd., Oceanside, **$175,000**; plans completed highway pavement Back Rd., **$227,863**; Franklin St., **$84,400**; Mill Rd., Hewlett, **$97,160**; Old County Rd., **$52,624**; Merrick Rd., **$112,300**; East Rockaway Rd., over Mill River Bridge, **$42,000**; Austin Blvd., **$353,934**; Front St. Hempstead-Brookfield Rd., **$30,941**; East Rockaway Rd., Ocean Ave. to Rockaway Ave., **$31,633**; Peninsula Blvd., Sect. 3, **$205,751**; Sect. 4, **$144,014**; Bayview Ave., **$90,000**; Peninsula Blvd., Sect. 2, **$106,000**; Baldwin Rd. and Grand Ave., **$100,000**; Berry Hill Rd., **$70,000**; Shore Rd., **$90,000**; rein.-con. highway pavement Roslyn, Mineola Rd. at Old County Rd., **$16,881**; rein.-con., and bituminous pavement Old County Rd., Franklin Ave. to Lawrence Ave., **$73,050.** Financing provided. J. C. Guibart, Comr. P. Wks., County Court House, engr. CD 8/17—ENR 9/6, under Postwar Projects.

N. Y., Permont—Village, Village, Hall, plans completed grading, paving 1200 ft. new streets, repaving 2800 ft. existing streets, **$27,691**; concrete curbing and sidewalks, **$14,578.** Financing provided. W. A. Yuda, village engr.

N. Y., Poughkeepsie—Comrs., Dutchess Co., County Court House, plans completed paving Netherwood Rd., Pleasant Valley to Hyde Park, **$41,498**; Wurtensburg Rd., Rhinebeck, **$16,861**; Pleasant Ridge Rd., Unionville, **$64,295**; Forst Mills to Clinton Hollow **$106,474**; plans under way paving Clove Valley to Wingdale, **$39,900**; Pawling Rd. at Haag Corners, **$87,600.** Financing provided. C. H. O'Brien, Court House, co. supt. hys. CD 8/31/44—ENR 9/21/44 under Postwar Projects.

N. Y., Rensselaer—City, City Hall, plans under way 8,299 lin. ft. rein.-con. street pavement on Riverside Ave., **$175,000**; concrete street paving, Forbes Ave., from Tracey St. to Washington Ave., **$44,000.** A. E. Kaufman, Rensselaer, consult. engr. CD 8/16/44—ENR 9/7/44 under Postwar Projects.

N. Y., Rochester—Comrs., Monroe Co., County Court House, plans completed embankment and new roadway, replacing abandoned bridge on Helendale Rd., Irondequoit; 1.5 mi. bituminous macadam pavement, county Rd., Pittsford; 1.9 mi. bituminous macadam pavement, county rd., Brighton, **$230,500.** Financing provided. F. H. Carroll, Div. P. Wks., engr. CD 5/22/44—ENR 6/1/44 under Postwar Projects.

N. Y., Troy — Comrs., Rennselaer Co., Court House, Troy, plans under way macadam highway pavement 3.4 mi. Rd. 90, Snyders Corners to Poestenkill Rd., **$20,000**; 1.1 mi. C. R. 94, **$5,000**; 1 mi. C. R. 14, **$8,983**; 1.8 mi. C. R. 97, **$10,000**; 1.7 mi. C. R. 95, **$10,000**; 2.3 mi. C. R. 98, **$15,000**; 1.4 mi. C. R. 60, **$11,148**; 3.6 mi. C. R. 109, **$20,000**; 6.8 mi. C. R. 44, **$35,000**; 3.4 mi. C. R. 80, **$25,000**; 2.7 mi. C. R. 64, **$12,000**; 3.1 mi. C. R. 42, **$10,000**; 2 mi. C. R. 13, **$12,000**; 3.6 mi. C. R. 71, **$20,000**; 1.2 mi. Edwards Rd., **$12,000.** J. W. Hansen, co. supt. hys. CD 4/14/44—ENR 5/4/44 under Postwar Projects.

N. Y., Wampsville—Comrs., Madison Co., Wampsville, plans completed 7.5 mi. macadam pavement Merrillsville to Stockbridge Falls, towns of Lincoln, Smithfield and Stockbridge, **$126,500**; 3.1 mi. East Hamilton to Moscow Hill, towns of Hamilton and Brookfield, **$39,800.** Financing provided. L. H. Johnson, co. supt. hys.

N. Y., Wampsville—Comrs., Madison Cor., Wampsville, plans completed paving 2.5 mi. East Lake Rd., at Cazenovia, **$30,600**; 1.5 mi. macadam pavement, County Rd. from Pratts Hollow to Bear Path, Eaton, **$24,000**; paving 3.2 mi. Middle Rd., Stockbridge, **$43,000**; Quarry Rd., Sullivan, **$29,500**; 5.2 mi. Pierceville, Lebanon Rd., Eaton and Lebanon Co., **$82,100**; macadam paving 4.2 mi. Erieville-Sheds Rd., **$59,600**; 3.4 mi. New Guinea Rd., Sullivan **$35,000**; 3.25 mi. Mt. Hope Rd., Oneida, **$46,200**; 3.5 mi. from Earlville to Randallsville, Lebanon, **$57,000**; 3.5 mi. from Madison to Hamilton, Madison, **$52,750**; 3 mi. County Rd., Oneida to Schoolheimer, Oneida, **$57,500**; 3.5 mi. from South Hamilton to county line, Hamilton, **$73,280**; 3.2 mi. from Perryville to Chittenango Falls, Fenner, **$52,000.** Financing provided. L. E. Johnson, co. supt. hy., engr. CD 4/7/44—ENR 4/20/44, under Postwar Projects.

O., Toledo—City, City Hall, rein.-con repaving 2,212 ft. Wright Ave. from Spencer to Nelson Sts., **$52,000**; grading, draining, paving Laurel Ave., **$22,500.** C. Piper, City Hall, city engr.

Oklahoma,—State Highway Dept., Capitol, Oklahoma City, 15 mi. asphalt pavement on U. S. No. 69 between Vici and Arnett, **$80,000.** Financing not provided. H. E. Bailey, Capitol, Oklahoma City, engr.

Okla., El Reno—City concrete pavement 18 blocks, Kiowa, Canadian, Missouri and 10 Sts., **$90,000.** Financing not provided. A. Sawillsch, engr.

Okla., Muskogee—Muskogee Co., Muskogee, 103 mi. farm-to-market road program, **$450,000.** Financing not provided. H. E. Bailey, Capitol, Oklahoma City, engr.

★**Okla., Okemah**—Okfuskee Co., county wide road improvements, **$600,000.** Financing not provided. M. R. Hart, Daniels Bldg., Tulsa, engr.

★**Okla., Oklahoma City**—Oklahoma Co., Helen Nix, clk., Oklahoma City, voted bonds constructing 153 mi. roads. **$1,650,000.** C. W. McFerron, Court House, Oklahoma City, engr. CD 10/29—ENR 11/15.

★**Okla., Shawnee**—Pottawatomie Co., B. W. Dierker, clk., Court House, defeated bonds, permanent road sys., **$800,000.** Financing not provided. F. D. Brown, Shawnee, engr. CD 11/1—ENR 11/29.

Okla., Tecumseh—City, paving 10 blocks of Kiekapoo, Fox and Pottawatomie Sts., **$45,000.** Financing not provided. F. D. Brown, Shawnee, consult. engr.

★†**Oregon**—Pub. Roads Admin., P.O. Box 3900, Portland, grading, surfacing 4.3 mi. Oregon Coast Hy., **$607,000**; 15.5 mi. South Santiam Hy., **$215,000**; 2.6 mi. Timberline Lodge Hy., **$295,000**; 6.5 mi. Ochoco Hy. in Crook Co., **$300,000**; 5.2 mi. Klamath Falls-Lakeview Hy., **$150,000**; 5.2 mi. John Day Hy., **$125,000**; 6.9 mi. Warm Spring cutoff in Wasco Co., **$230,000**; 4.6 mi. trans-Cascade Willamette Hy., **$106,000.** Financing provided. W. H. Lynch, div. engr. CD 11/26.

Tex., Alamo Heights (mail San Antonio)—City, G. E. Hoff, mayor, 6116 Bway., San Antonio, plans 60% completed, street paving, imprvs. **$243,125.** Financing not provided. J. V. Curnutte, 205 Redwood St., San Antonio, consult. engr. CD 10/26—ENR 11/15.

★**Tex., Beaumont**—Jefferson Co., W. W. Pat Kent, judge, Court House, asphalt road paving, **$200,000**; graveling, imprv. feeder roads, **$250,000**; farm-to-market roads, **$300,000.** Financing not provided. B. F. Shipley, Beaumont, consult. engr.

Tex., Beaumont—Jefferson Co., c/o Judge, Beaumont, voted bonds, road work in Hampsire Area, **$264,000.** Financing provided. CD 12/5.

★**Tex., Dallas**—City, City Hall, voted [illegible] street paving, **$1,000,000**; opening, w[illegible] ing, grading, etc., streets, **$1,275,000.** [illegible] 11/5—ENR 11/29.

Tex., Galveston—City, G. W. Fr[illegible] mayor, City Hall, voted bonds addnl. st[illegible] paving, **$400,000**. P. A Milligan, City H[illegible] engr. CD 10/25—ENR 11/15.

★**Tex., Houston**—Comrs. Harris Co., C[illegible] House, plans 25% completed [illegible] imprvs, in Precincts 3 and 4, incl. deve[illegible] ment Bammel and Jack Rabbit Rds., [illegible] 30 ft. bituminous surfaced road 11½ [illegible] long, **$450,000**; asphalt and concrete pav[illegible] sewers, 9 mi. Yale St., Waller-Tom [illegible] Rd., Jack Rabbit Rd., Precinct 4, **$550,000**; bituminous on concrete widening 3½ [illegible] Bellaire Blvd., concrete paving 1¾ [illegible] Westheimer Rd., 4 mi. Post Oak Rd., P[illegible] 1, **$325,000.** Financing provided. Howe & Wise, Stewart Bldg., Houston, consult. engrs. H. Zapp, engr.

Tex., Houston—City, City Hall, exten. Fannin St., and asphalt paving. **$245,000.** Financing provided. G. I. Fugate, City Hall, consult. engr.

Tex., Kerens—G. M. Chapman, mayor, City Hall, plans under way street paving, **$54,100.** J. H. Flood & Co., 1207 Amicable Bldg., Waco, consult. engrs.

Tex., San Angelo—City, City Hall, plans 10% completed asphalt paving 200 blocks. **$200,000.** Financing provided. J. P. Burden, City Hall, city mgr.

Tex., San Antonio—Bexar Co., Court House, plans 50% completed widening and asphalt paving Bandera Rd. adjacent to city limits, **$50,000.** Financing provided.

Tex., San Antonio—Travis-Soledad Corp. & Assoc., Travis Bldg., plans 50% completed, constructing, paving streets Nacogdoces Rd. area. **$40,000.** Financing provided.

Tex., Seymour—City, City Hall, plans 60% completed paving, **$65,400**; plans 40% completed asphalt street paving, **$65,000**; plans 50% completed street paving, **$65,000**; 3 street paving jobs, **$65,400** each. Financing provided. J. E. Ward, Wichita Falls, consult. engr.

Tex., Seymour—C. M. Randal, mayor, City Hall, street paving. **$475,210.** J. E. Ward, Allison-Duncan Bldg., Wichita Falls, consult. engr.

Tex., Sherman—City, City Hall, road work, incl. widening paving for 70 ft. street. **$75,000.** Financing provided.

Tex., Waco—City, City Hall, plans 25% completed, squeegee paving, incl. concrete curbing, gutters, **$32,000.** Financing provided. C. Border, City Hall, engr.

★†**Washington**—Pub. Rds. Admin., P.O. Box 3900, Portland, Ore., grading and surfacing 4.5 mi. Olympic highway, **$211,000**; 6.8 mi. Lewis River highway N.E. of Vancouver, **$130,000**; 6.2 mi. Mt. Adams highway, **$185,000**; 1.2 mi. Randle-Yakima highway, **$132,000.** W. H. Lynch, div. engr.

Washington—State Hy. Dpt., C. B. Shain, dir., Olympia, straightening Lake Chelan Rd. and installing guard rail, Chelan Co. **$300,000.** Financing not provided.

★**Washington**—State Hy. Dpt., C. B. Shain, hy. dir., Olympia, exten. 11 mi. Secondary State Hy. 13-A from Tokeland to Raymond. Pacific and Grays Harbor Counties. **$1,500,000.** Financing not provided.

Ont., Belleville—Hastings Co., Belleville, road and bridge construction. **$140,000.** W. L. Langlois, County Bldg., engr. CD 2/28/44—ENR 3/9/44, under Postwar Projects.

Ont., Brampton—Peel Co., Brampton, road construction. **$150,000.** N. L. Powell, County Bldg., engr.

Ont., Cornwall—Stormont Co., Cornwall, grading, widening, base, and blacktop surfacing, maintenance. **$250,000.** J. G. Cameron, County Bldg., engr.

Ont., Guelph — Wellington Co., Guelph, road construction. **$200,000.** W. H. Keith, County Bldg., engr.

Ont., Kingston—Municipality, voted **$75,000** bonds for street paving. D. Jack, City Hall, engr.

Ont., Kitchener—Waterloo Co., Kitchener, roads. **$400,000.** D. J. Emery, County Bldg., engr.

Ont., Lindsay — Victoria Co., road construction. **$50,000.** H. Wieford, County Bldg., engr.

★**Ont., Napanee** — Lennox Co., Napanee, road construction. **$120,000.** H. L. Schermerhorn, County Bldg., engr.

Ont., Owen Sound—Grey Co., Owen Sound, road construction. **$160,000.** J. A. Fletcher, County Bldg., engr.

Ont., Pembroke—Renfrew Co., Pembroke, road construction. **$185,000.** W. J. Moore, County Bldg., Pembroke, engr. CD 2/10/43—ENR 2/18/43 under Postwar Projects.

Ont., Peterboro—City, A. E. Outram, clk., voted **$175,000** bonds, for paving. R. H. Parsons, city engr. CD 11/13—ENR 12/13.

Ont., St. Catherines—Lincoln Co., St. Catherines, road construction. **$210,000.** F. E. Weir, County Bldg., engr.

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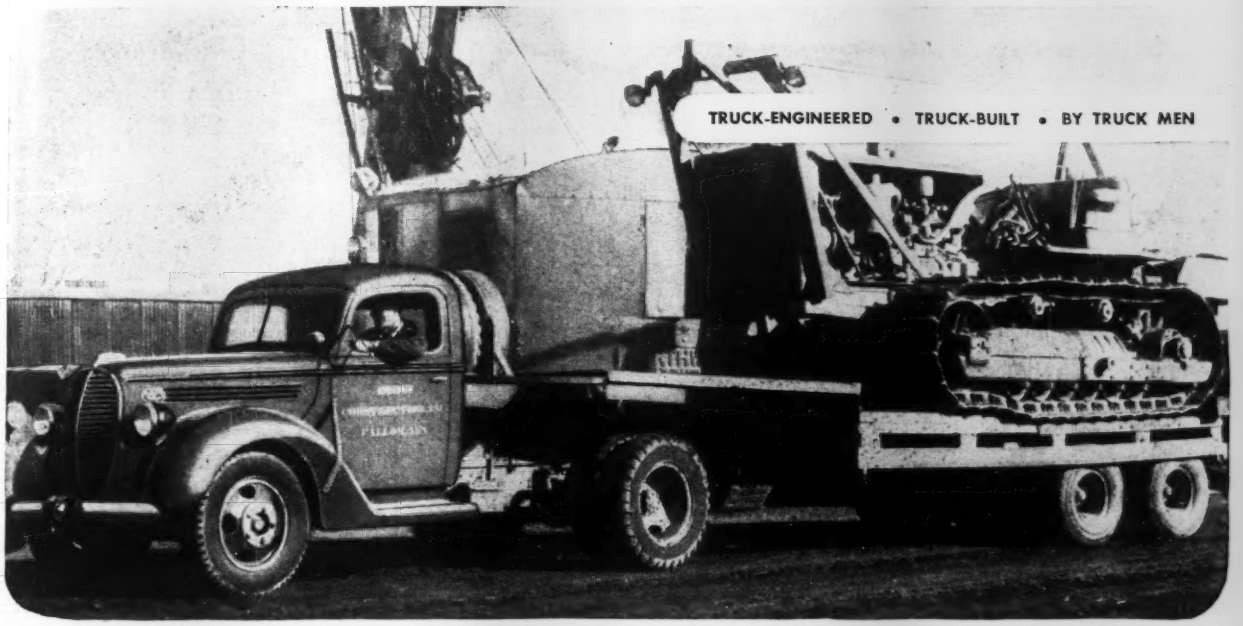

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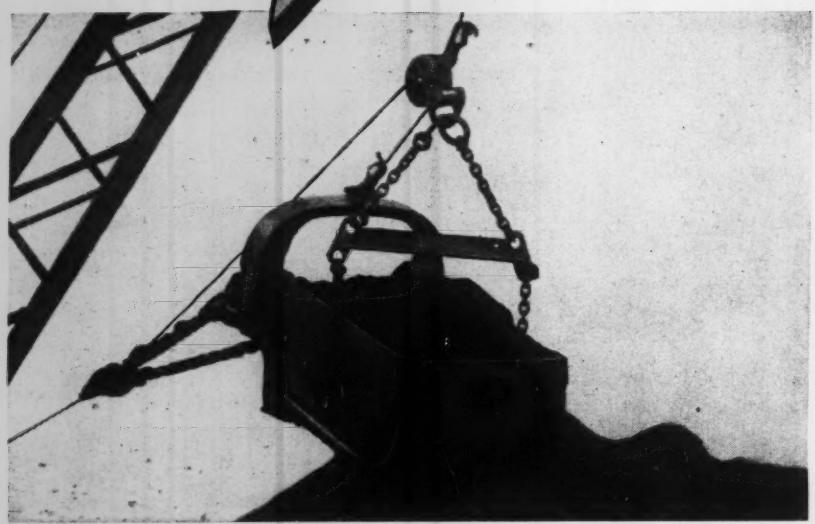

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STREETS, etc. (Proposed Work, Cont'd.)

Ont., Sarnia — Lambton Co., Sarnia road construction. **$130,000.** J. C. Monteith, County Bldg., engr. CD 11/9/43—ENR 11/11/43, under Postwar Projects.

Ont., Trenton—Municipality, c/o W. J. Potts, clk., voted **$100,000** bonds for paving. CD 11/12—ENR 12/13.

Ont., Whitby—Ontario Co., Whitby road construction. **$155,000.** D. J. Keaw, County Bldg., engr.

EARTHWORK, WATERWAYS

PROPOSED WORK

Calif., Napa—City of Napa, City Hall, plans raising Eastside Reservoir. Over **$15,000.** A. Kempkey, Balboa Bldg., San Francisco, consult. engr. CD 9/5—ENR 9/7.

Calif., Whittier—City, 205 N. Greenleaf St., plans completed removing old asphalt paving, rebuilding concrete pavement. **$75,000.** M. Bowen, city engr.

Ind., Lafayette—Norman Drainage Comrs., c/o A. F. Burkle, supt., Courthouse, Lafayette, 20.5 mi. open drainage ditch, main line and laterals. **$64,274.**

Mich., St. Joseph—City, G. A. Cook, chm. Harbor & Development Com., plans under way harbor imprvs., incl. boat slips, docks and basin; interlocking steel sheet piling, wood piling. **$50,000.**

N. J., Montclair—Town, Town Hall, plans under way Toney's Brook imprvs., Bloomfields Ave. to Chestnut St., **$300,000.** Financing not provided. F. M. Galloway, Supt. P. Wks., engr.

★**New York**—Black River Regulating Dist., 330 Electric Bldg., Watertown, plans under way dam and reservoir on Moose River controlling flow in Black River, Jefferson Co. **$1,747,000.** Eng. Dpt., c/o owner, engr.

N. Y., Mineola—Comrs., Nassau Co., County Court House, Mineola, plans under way 4,350 ft. ditching, Garvin Blvd. to Southern State Parkway, **$45,000;** 4,300 ft. ditching and 30 ft. concrete box culverts, Baldwin Creek, Sects. 2 and 3, Merrick Rd. to Seaman Ave. at Baldwin, **$80,000.** J. C. Gulbart, Comr. P. Wks., engr. CD 11/13/44—ENR 11/30/44, under Postwar Projects.

★**N. Y., Rochester** — Comrs., Monroe Co., Rochester plans completed channel imprvs., in 17 streams adjacent to county highways, **$974,000.** Financing provided. F. H. Carroll, Div. P. Wks., engr. CD 12/13/43—ENR 12/23/43, under Postwar Projects.

O., Athens—Ohio Dpt. Conservation, State Office Bldg., D. Waters, dir., Columbus, Burr Oak Dam on Sunny Creek creating 750 acre lake. **$350,000.**

Okla., Geary—Canadian Valley Irrigation Dist., Geary, voted bonds, irrigation dist. in Canadian River Valley. **$200,000.** CD 11/21.

Okla., Haskell—City, levee imprvs. along water plant. **$25,000.** Financing not provided. T. P. Clonts, Muskogee, engr.

†**Ore., Warrenton** — U. S. Eng., Pittock Block, Portland, mooring basin for small boats. **$250,000.** Financing not provided.

Pa., Slippery Rock—Boro of Slippery Rock, 3 mi. c.i. water line, 2 brick reservoirs. **$45,000.** S. J. Taylor, 323 Franklin St., engr.

★**Tex., Galveston**—City, G. W. Fraser, mayor, City Hall, voted bonds, drainage and facilities preventing overflows. **$770,000.** P. A. Milligan, City Hall, engr. CD 10/25—ENR 11/15.

Tex., Galveston—City, City Hall, defeated bonds, earthwork for filling East End Flats. **$380,000.** P. A. Milligan, City Hall, engr. CD 10/25—ENR 11/15.

Tex., Port Arthur — Jefferson Drainage Dist. 7, Port Arthur, drainage project. Over **$100,000.** Financing not provided. Chas. P. Smith, Box 684, Orange, consult. engr.

Tex., San Antonio—Thurman Barrett & Assoc., 6109 S. Flores St., irrigation project using sewage effluent from Mitchell Lake. **$100,000.** Financing provided.

Wis., Viroqua—Kickapoo Flood Control Assn., Viroqua, dam, reservoir and about 1 mi. levee, near here. Vernon and Crawford Counties.

Ont., Harwich—Harwich Twp., protective earthworks or concrete structure to prevent Lake Erie from inundating surrounding marsh. **$40,000-$50,000.** G. A. McCubbin, Chatham, engr.

O., Kingston — Municipality, developing 200 acre marshland for industries. **$50,000.** Marsh and Land Development Bd., Kingston, engrs.

LATIN AMERICA

Bolivia, La Paz—Republic of Bolivia, La Paz, plans domestic rubber mfg. plant. Over **$150,000.** Dpt. P. Wks., La Paz, engr.

Bolivia, La Paz—Republic of Bolivia, La Paz, plans national cement factory. **$250,000.** Dpt. P. Wks., La Paz, engr.

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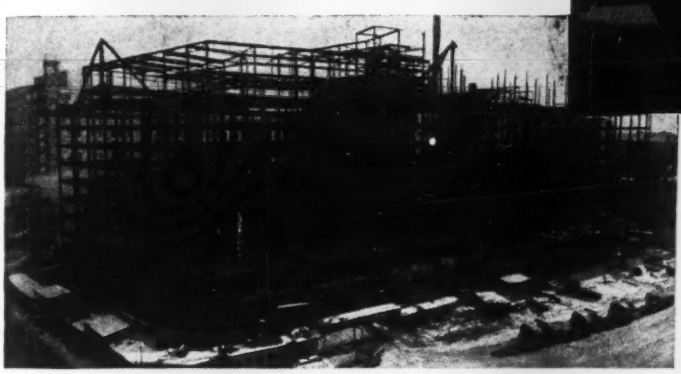

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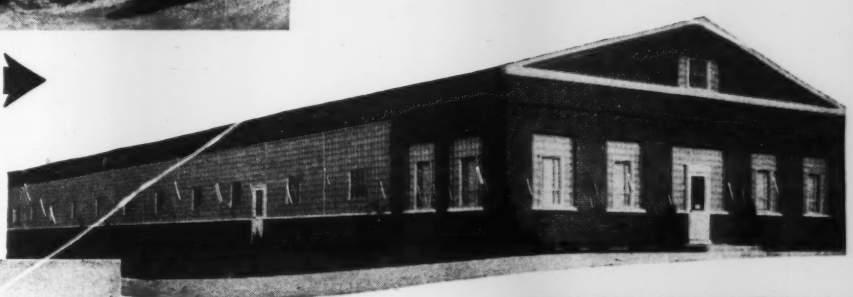

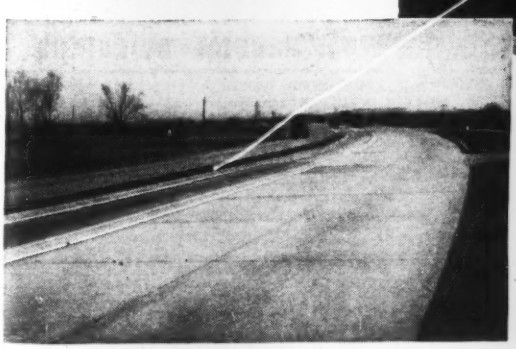

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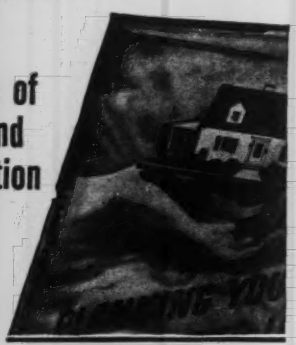

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LATIN AMERICA. (Cont'd.)

Brazil, Rio Grande—Companhia Brasileira de Petroleos, Rio Grande, plans distillation unit addn. **$150,000.**

B. W. I., St. George—Government of Granada, St. George, plans 3 story 75x200 ft. office bldg., waterfront. **$150,000.**

Chile—State Railway Co., Santiago, plans railroad from Los Alamos to Colico. **$500,000.**

Chile, Concepcion — Republic of Chile, Santiago, plans model village and dwellings. **$500,000.** Minstry of Pub. Wks., Santiago, engr.

Chile, Concepcion — Huachipate Iron Works, Concepcion, plans plant. **$200,000.**

Chile, Puerto Saavedra—Republic of Chile, Santiago, plans harbor. **$250,000.** Ministry of Pub. Wks., Santiago, engr.

Chile, Valdivia—Republic of Chile, Santiago, plans canalizing river from ocean to Port of Valdivia. **$350,000.** Dpt. Wks. Santiago, engr.

Costa Rica, San Jose—Republic of Costa Rica, San Jose, plans road construction in agricultural district of Santa Clara. **350,000** Colones. Dpt. P. Wks., San Jose, engr.

Costa Rica, San Jose—Cia Nacional de Fuerzay Luz, San Jose, plans hydro-electric plant. **$5,000,000.**

Ecuador, Portoriego—Central Railway of Ecuador Ltd., Portoviego, plans road to Santo Ana, Province of Nanabi, **2,200,000** sucres.

Honduras, Comayaqua—Municipality, sewage system, **150,000** lempiras. Service Cooperative Inter-Americano de Salud Publica, Tegucigalpa, engr.

Honduras, San Pedro Sula—Municipality, plans water supply system, **275,000** lempiras. Servicio Co-operativo Interamericano de Salud Publica, Tegucigalpa, engr.

Mexico—Dpt. P. Wks. & Communications, Mexico City, plans 50% completed, grading road between Tehuantepec and San Christobal las Casas., **$450,000;** plans under way road between San Christobal las Casas and the Guatemala border, **$1,000,000.** Financing provided.

Mexico—Dpt. P. Works, A. Camacho, pres., Tacuba St., Mexico City, plans federal highway through states of Mexico, Queretaro, San Luis Potosi and Coahuila. **$2,000,000.**

Mexico—State of Tamaulipas, c/o H. Pedro Gonzales, gov., Victoria, plans under way road imprvs., in Santande Jimenez, **$250,000;** in Tampico, **$450,000;** in Victoria, **$1,000,000;** in Santa Teresa, **$600,000;** in Soto La Marina, **$500,000.** Financing not provided.

Mexico, Acapulco—Federal Dist., and Guerrero Hoteles Hogar, S.A., Fernando Saldana Galvan, pres., Mexico City, plans hotel. **$1,000,000.**

Mexico, Chihuahua—Cementos de Chihuahua, S. A., I. La Catolica, 40-210, Mexico, D. F., plans cement factory. **$600,000.**

Mexico, Culiacan—State of Sinaloa, Gov. Pablo Macias Valenzuela, Capital City, Culiacan, plans sugar mill with 40,000 tons per year output. **$1,250,000.**

Mexico, Guadalajara—Federal Dist., and Guerrero Hoteles Hogar, S. A., Fernando Saldana Galvan, pres., Mexico City, plans hotel. **$1,000,000.**

Mexico, Leon — Municipal Government, Palacio Municipal, Dr. Salvador Monoz Orosco, mayor, plans public market. **$350,000.**

Mexico, Mexico City—Mauricio O. Amsler, Marsella 28, Mexico City, plans by T. Kunhardt, Mexico City, residential hotel. **$493,200.**

Mexico, Mexico City—Andres Garcia Cortina, Avenida Marti, 49 Mexico City, plans apartment Ave. Marti. **$360,000.**

Mexico, Mexico City—Hubardy Bourlon, Sucs., S. A., Enriquic Hubard, pres., Mexico City, plans factory mfg. electric switches, etc. **$200,000.**

Mexico, Mexico City—Bovedas Wilbert de Mexico S. A. 60 Juarez Ave., Mexico City, plans factory mfg. burial vaults. **$100,000.**

Mexico, Mexico City—Federal Dist. and Guerrero Hoteles Hogar, S. A., Fernando Saldana Galvan, pres., Mexico City, plans hotel. **$1,000,000.**

Mexico, Mexico City—A. Diaz Izquierdo, Ave. Moliere, 334-40, Mexico, D. F., plans 4 apartment houses. **$575,000.** E. M. Soto Cerbon, Hidalgo, 90 Mexico, D. F., archt.

Mexico, Mexico City—F. and E. Larezgoiti, Insurgentes, 485, Mexico, D. F., plans apartment. **$250,000.** Ricardo Cicero y Garita, Varsovia, 58-a, Mexico, D. F., archt.

Mexico, Mexico City—Margarita Nunez de Norfin, Galzada del Obrero Mundial, 155 Mexico City, plans apartment. **$350,000.** Francisco Rodriguez Cano, Mexico City, archt.

Mexico, Mexico City—A. L. Salinas, Tabasco, 189, Mexico, D. F., plans food products factory. **$115,000.** R. Troyo, Agricultura, 12 Mexico, D. F., archt.

Mexico, Mexico City—Tarsila Fernandez de Perez, Uruguay 227, Mexico City, plans apartment, on Uruguay. **$293,000.** E. Rodrigo Robles Piquer, Mexico City, archt.

Mexico, Monterrey—State of Nuevo Leon, Gov. Arturo B. de la Garza, Monterrey, plans hospital, clinic and health bureau repairs. **$850,000.**

Mexico, Queretaro—Federal Dist. and Guerrero Hoteles Hogar, S. A., Fernando Saldana Galvan, pres., Mexico City, plans hotel. **$1,000,000.**

Mexico, Tlaxcala—State, R. Avila, gov., Capital City, Tlaxcala, plans water works for Calpulalpan, Nanacamilpan, San Felipe Hidalgo, Mazapa, Tapuente and Sanctorum. **$110,000.**

Panama, Colon — Republic of Panama, Panama City, plans filling in swamplands to provide addnl. building sites. **$2,000,000.** Ministry Pub. Wks., Panama City, engr.

Panama, Macaracas—Republic of Panama, Panama City, plans road from Macaracas to main hy., Los Santos Province. **$300,000.** Dpt. P. Wks., Panama City, engr.

Peru, Callao—Republic of Peru, Lima, dredging Callao Harbor, involving 50,000,000 cu. ft. excavation. Ministry Pub. Wks., Lima, engr.

FOREIGN

Australia, Canberra—Bitumen & Australian Oil Refineries, Ltd., Canberra, plans under way oil refinery plant. **$2,500,000.** Financing provided.

Egypt—Hydro-Electric Dpt., Ministry P. Wks., Cairo, plans under way hydro-electric generating station at Aswan Reservoir, incl. Civil Engineering Works and Bldgs., seven 57,000 hp. Kaplan type water turbines and auxiliaries, seven 45,000 KVA alternators-exciters and auxiliaries, switchgear, bus bars and supports, connections, metering synchronizing equip. and protective gear, three 105,000 kva main transformers, cables and wiring, penstocks and butterfly valves, cranes. Kennedy & Donkin, 12 Caxton St., London, S.W. 1, England, engrs.

PUBLIC BUILDINGS

PROPOSED WORK

†**Mass., Onset**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mass., Orleans**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mass., Osterville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mass., Oxford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mass., Randolph**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mass., Scituate**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

T. H., Honokaa—Hawaii Co., County Bldg., Hilo, 50-bed general hospital. **$209,000.** E. L. Wung, c/o owner, archt.

B. C., Kimberley—Kimberley Consolidated School Dist., school. **$175,000.**

Ont., Cardinal—Bd. School Trustees, Cardinal, plans by Drever & Smith, 80 Brook St., Kingston, high school. **$150,000.**

Ont., Cooksville—Municipality, c/o W. M. Leonard, 7 Orchard Rd., community center, incl. municipal bldg., auditorium, swimming pools, badminton courts. **$175,000.**

Ont., Thornbury—Thornbury School Bd., A. E. Cummings, chn., plans by J. W. Warren, 7 Hughson St., Hamilton, 250x250 ft. brick, tile high school, **$200,000;** high school **$175,000.**

COMMERCIAL BUILDINGS

PROPOSED WORK

Calif., North Hollywood—D. S. Garber c/o Lindsay-Vaughn and Patterson, archts., 3380 Rodeo Dr., Los Angeles, 2 story, steel sash, reinforced-brick medical bldg., Landale St. and Vineland Ave. **$175,000.**

Calif., San Fernando—E. F. Thomas, et al, c/o O. H. Strom, archt., 634 N. Citrus St., Glendale, hotel, Baldwin property adjacent to San Fernando Mission du Rey de Espana. **$150,000.**

Conn., Trumbull—P A T Corp., 955 Main St., Bridgeport, plans by E. Larson, 72 Brooklawn Parkway, Fairfield, residential frame homes, N. Main St. **$150,000.**

★ **Ill., Chicago**—Owner c/o B. L. Steif, archt., 1022 N. Rush St., indoor and outdoor theater, chain stores and concessions, brick, concrete. **$1,000,000.**

Ill., Waukegan — Johnson Motors Co., Waukegan, plans by Eschweiler & Eschweiler, 720 E. Mason St., Milwaukee 2, Wis., 2 story, steel, brick office. **$150,000.**

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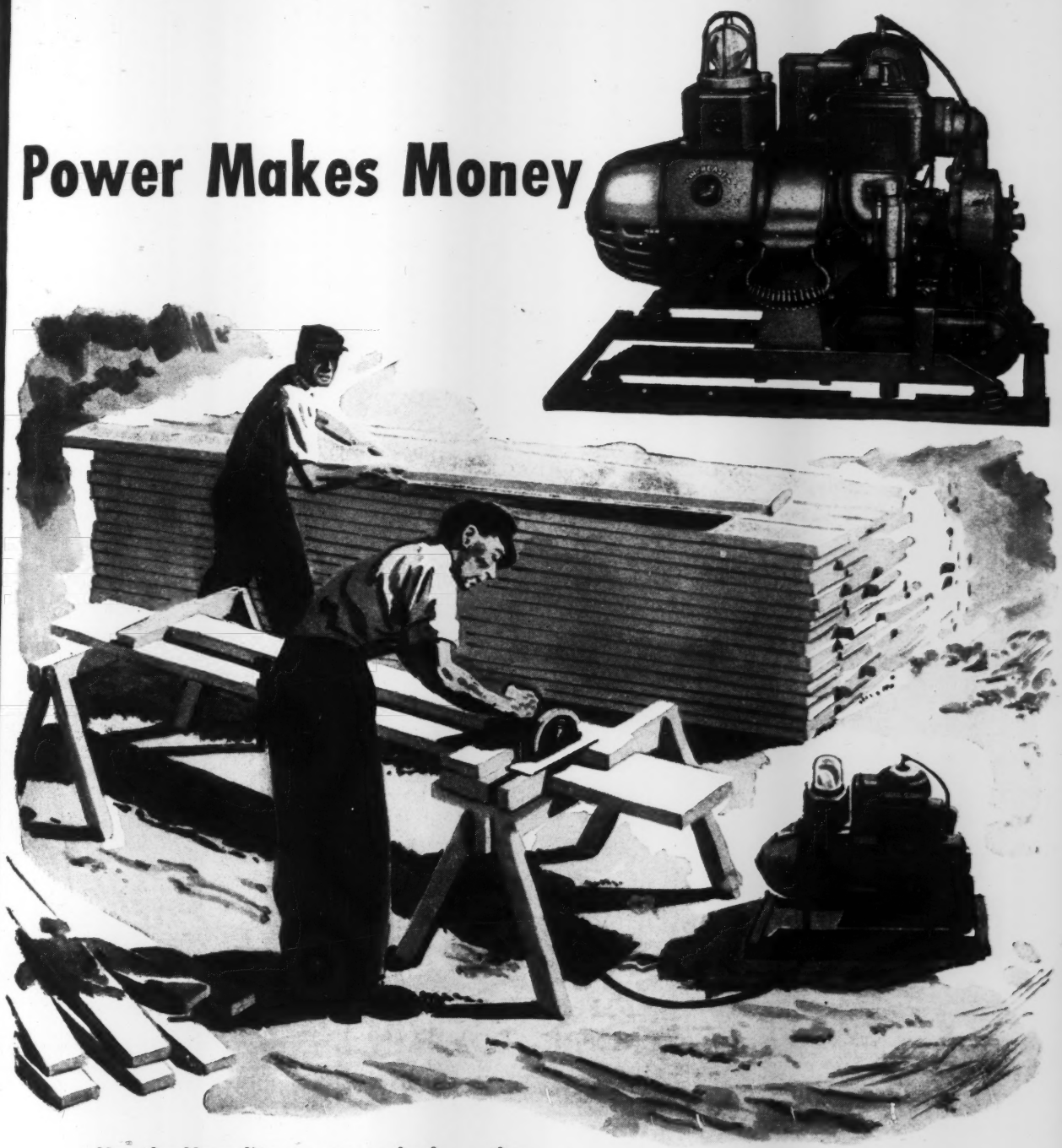

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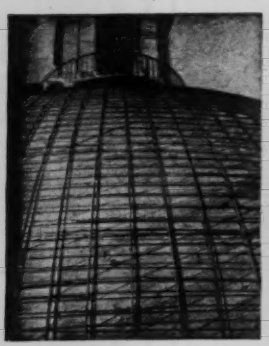

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COMMERCIAL BLDGS. (Proposed Work, Cont'd.)

Md., Baltimore—College of Notre Dame, N. Charles St., dormitory and science bldg. $250,000. Financing not provided.

★ **Mass., Boston**—Northeastern University, C. S. Ell, pres., 360 Huntington Ave., plans by Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., concrete, brick, stone auditorium, over $250,000; lecture bldg. exceeding $250,000; chapel, exceeding $150,000; library, exceeding $250,000. Financing provided.

Mich., Hamtramck—Our Lady Queen of Apostles Parish, c/o Herman & Simmons, archts., 804 Transportation Bldg., Detroit, brick, steel, stone convent. $150,000.

N. H., Concord—Young Mens Christian Assn., Concord, plans by Building Bureau, National Council, Y.M.C.A., 347 Madison Ave., New York, N. Y., 3 story, brick bldg. alterations, incl. swimming pool, enlarging gymnasium, adding 12 rooms to dormitory. $200,000. Financing not provided.

O., Dayton—Greek Orthodox Church, c/o W. Stoycus, 238 Aberden Ave., Zone 9, plans 90% completed by Eugene Bros., Inc., 1316 W. 63 St., Chicago, Ill., 14x85 ft., limestone, brick church. $150,000.

★ **O., Lakewood**—Bd. Trustees, Lakewood Hospital, 14519 Detroit Ave., 6 story wing addn. to hospital. $1,500,000. Financing provided.

Pa., Butler—Young Womens Christian Assn., Butler, 3 story, bsmnt., brick YWCA. Bldg. $150,000. Financing not provided.

Tex., Dallas—Gulf Insurance Co., Thomas Bldg., plans by B. W. Lanum & Associates, Texas Bank Bldg., office, Cedar Springs Rd. and Dickason St. $200,000. Financing provided.

★ **Tex., Houston** — Memorial Hospital, 602 Lamar St., plans completed by K. Franzheim, 2306 Crawford St., 8 story, hospital addn. $1,000,000. Financing provided. F. J. Niven, 2306 Crawford St., structural engr. CD 3/7—ENR 3/22, under Postwar Projects.

Tex., Houston—Riverside Memorial Methodist Church, North McGregor and St. Bernard Sts., plans completed by H. C. Moore, 2008 W. Alabama St., church. $175,000. Financing not provided.

Vt., Rochester—Federated Church, c/o Freeman, French & Freeman, archts., 138 Church St., Burlington, preliminary plans 2 story, bsmnt., brick, stone church. To exceed $150,000. Financing provided.

Wis., Whitefish Bay—St. Monicas Catholic Church, 5631 N. Santa Monica Blvd., Zone 11, plans by A. C. Runzler, 728 N. Jefferson St., Milwaukee, Zone 2, superstructure on church and parsonage imprvs. $150,000.

Ont., Baden—Dominion Linseed Oil Co. Ltd., 587 W. Fleet St., Toronto, worker's dwellings. $150,000. Site purchased.

Ont., Kingston—J. L. Smith and Sons, 284 Collingwood St., 24 dwellings. $150,000.

★ **Ont., Sarnia**—D. M. Fischer, Royal Hotel, Guelph, 165 room hotel. About $500,000. CD 11/12—ENR 11/22.

Que., Quebec City—Congregation des Freres du Sacre Coeur, Rev. Frere David, provincial, Arthabaska, Que., novitate at Ancienne Lorette, near here. About $200,000.

★ **Que., Quebec City**—M. Fournier, 621 Parliament Bldg., 140 dwellings. $700,000.

Que., St. Hyacinthe—R. C. Episcopal Corp., St. Hyacinthe, church. $150,000.

★ **Que., Val D'Or** — The Congregation of Grey Nuns, Nicolet, plans by Rousseau & Begin, 1 Ferland St., Quebec City, hospital. $650,000.

Que., Valleyfield—Protestant School Bd., Valleyfield, gymnasium and assembly hall addns. to Gault Institute. $150,000.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Calif., Burbank—FACTORY—Hydro-Aire Co., 626 N. Robertson Blvd., Los Angeles, preliminary plans by R. B. Brout, 1709 W. 8 St., Los Angeles, 100x100 ft., steel, reinforced brick factory, 300 W. Winona St. Over $40,000.

★ **Calif., Pasadena** — FACTORY — Allied Products, Inc., Division St., Suffern, N. Y., plans by Stiles Clements Assoc. Architects & Engineers, Van Nuys Bldg., Los Angeles, 1 and part 4 story cosmetic factory, Foothill Blvd. near Eaton Wash. $500,000.

Calif., Los Angeles—FACTORY—Ross and Co., 429 N. Beverly Dr., Beverly Hills, plans by Stiles Clements Assoc. Archts. & Engrs., Van Nuys Bldg., 6 story, 76x100 ft., steel sash, rein.-con. factory, 528 E. 8 St. $200,000.

Calif., Santa Fe Springs—PLANT—Pacific Lighting Corp., 630 W. Los Nietos Rd., reconstructing compressor plant. About $100,000.

★ **Ga., Atlanta**—FACTORY—Crown Cork & Seal Co., 55 Forsyth St. SW, Baltimore, Md., plans 75% completed, by Robert & Co., Bona Allen Bldg., factory. $2,000,000.

Ga., Atlanta—FACTORY—Evans Candy Co., 126 10 St. NE, plans under way factory. $100,000.

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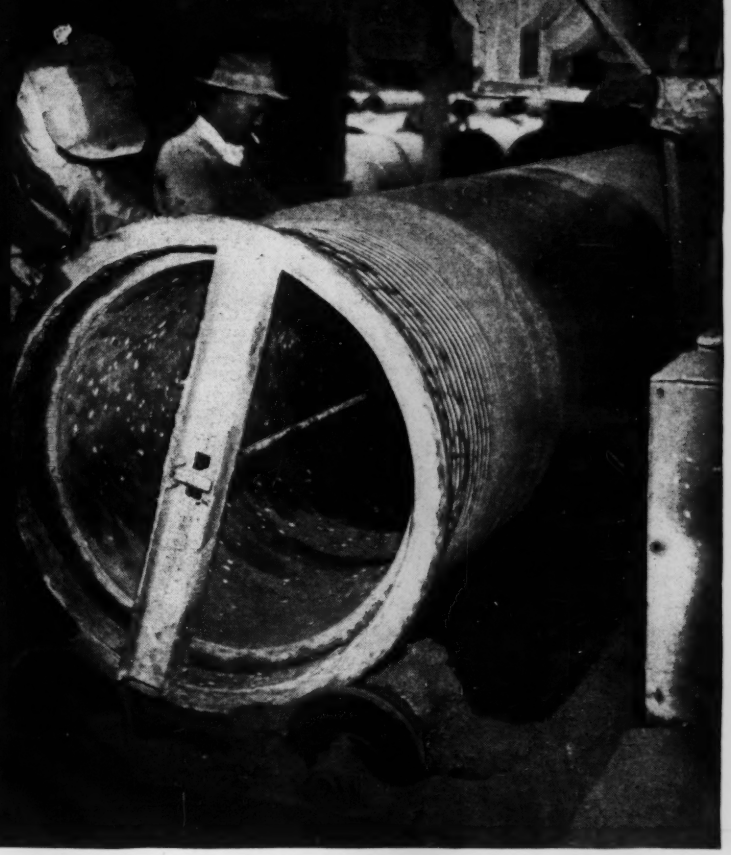

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INDUSTRIAL BLDGS. (Proposed Work, Cont'd.)

Ill., Chicago—FACTORY—Great Lakes Plating & Japanning Co., 1715 N. Bosworth St., plans by V. Charn, 4744 W. Rice St., 1 story, 100x180, brick, concrete, steel factory addn.

Ill., Peoria Heights—BREWERY—Pabst Brewing Co., 3431 Prospect Rd., plans by Harley, Ellington & Day, engrs. and archts., 1507 Stroh Bldg., Detroit, Mich., brick, steel, concrete, steel frame brew house, laboratory, and office. About **$150,000.**

Ind., Indianapolis—PLANT—Winston Machine Co., B. A. Winston, pres., 1102 Burdsal Parkway, brick, concrete plant addn. **$75,000.**

Me., Lewiston — WAREHOUSE — Soule Brothers, 137 Preble St., Portland, 1 story, 65x200 ft., rein.-con. warehouse, Main St. **$50,000.** A. J. Harriman, 292 Court St., Auburn, archt.

Mass., Waltham — WAREHOUSE — P. Burke, 167 Prospect St., plans by A. M. Kreider, 259 Washington St., Newtonville, 2 story, 75x95 ft., brick, concrete furniture warehouse. **$45,000.** Financing provided.

Mich., Detroit—TECHNICAL CENTER—General Motors Corp., General Motors Bldg., plans under way, sewer work and water line at motor research technical center. Excavation work, awarded to Charles J. Rogers, Inc., 14836 Grand River Ave., Detroit. Saarinen & Swanson, 309 Wabeek Bldg., Birmingham, archts. Hubbell, Roth & Clark, 2640 Buhl Bldg., engrs. on excav., sewers and watermains. CD 8/13—ENR 8/23, under Postwar Projects.

Mich., Grand Rapids—FACTORY—McInerney Spring & Wire Co., Grand Rapids, plans 50% completed by B. Hertel, 38 Pearl St., 1 story, brick, concrete factory addn. **$40,000.**

Mont., Helena—PLANT—Steffeck Equipment Co., Helena, plans by Corwin & Co., Inc., Medical Arts Bldg., Great Falls, remodeling 1 story, 70x140 ft. equipment bldg. **$40,000.** Financing provided.

N. Y., New York—INDUSTRIAL—Wm. S. Sussman, 15 W. 44 St., Zone 18, industrial bldg., 439-445 W. 39 St. Over **$150,000.** (Owner will construct).

N. C., Winston-Salem—PLANT—Duplan Corp., 512 7 Ave., New York, N. Y., plans by Lacy, Atherton, Wilson & Davis, engrs.-archts., Hotel Sterling Bldg., Wilkes-Barre, Pa., 1 story nylon processing mill. **$250,000.** CD 11/12—ENR 11/22.

★**Ore., Portland** — REFINERY—California Asphalt Corp., Standard Oil Co. of Calif., Pacific Bldg., refinery, near here. **$1,000,000.**

Pa., Johnstown — FACTORY — Johnstown Sanitary Dairy Co., 410 Franklin St., plans by McCormick Co., Inc., 121 S. Negley Ave., Pittsburgh, 1 story, glass brick factory addn. **$40,000.**

Pa., Pittsburgh—FACTORY—E. L. Wiegand Co., Thomas Blvd., plans by Prack & Prack, Martin Bldg., 2 story, 98x161 ft., concrete, steel factory. **$100,000.**

Pa., Sharon — WAREHOUSE — Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, warehouse. **$250,000.** L. C. Mechling, Maloney Bldg., Blvd. of the Allies, Pittsburgh, ch. archt.

Pa., Sharon Hill — PRINTING PLANT — Curtis Publishing Co., Independence Square, printing plant.

Pa., York—MILL—Century Ribbon Mills, Inc., York, mill addn., incl. weave-shed. **$300,000.**

Man., St. Boniface—MILL—P. Blanchette, 270 Hamel St., shingle mill, etc. **$40,000.**

Ont., Hamilton—PLANT—Hamilton Bridge Co. Ltd., Bay St. N., 1 story, 70x140 ft., steel, brick, rein.-con. plant addn., 10 ton 235 ft. crane runway. About **$75,000.**

★**Ont., Hamilton**—PLANT—International Harvester Co. of Canada, Ltd., Sherman Ave., plant addns., incl. foundry, etc. **$2,500,000.** C. E. Blackburn, c/o owner, engr.

Ont., Port Arthur — WAREHOUSE — Brewers Warehouse Co. Ltd., Port Arthur, warehouse. **$60,000.**

Ont., St. Thomas—PLANT—Timken Roller Bearing Co. Ltd., 135 Quebec Ave. S.W., Canton, O., U. S. A., plans by Prack & Prack, 36 James St. S., Hamilton, 160x240 ft., concrete, brick, steel heat treatment bldg., 120x300 ft., brick screw bldg. About **$175,000.**

Ont., Toronto—PLANT—Marine Equipment Co., c/o C. G. Mac Lean, archt., 935 Avenue Rd., 1 story, 60x100 ft., brick, steel plant. About **$45,000.** CD 11/26—ENR 12/6.

Ont., Windsor—FACTORY—Lanork Industries Ltd., Windsor, factory. **$40,000.**

Que., Huntingdon — PLANT—Kensington Dairies Ltd., 7 Lake St., milk pasteurization and dairy products plant. **$40,000.**

Que., Montreal — MACHINE SHOP — St. Lawrence Dry Docks Ltd., 2050 W. Notre Dame St., machine shop. **$40,000.**

Que., Rimouski — FACTORY — Canadian Cod Liver Oil Co., Ltd., St. Germain St., J. A. Brillant, pres., 50x200 ft. and 126x125 ft., frame, concrete addnl. bldgs. About **$40,000.**

Que., St. Johns — FACTORY — Silex Co., Inc., St. Johns, factory. **$40,000.**

UNCLASSIFIED

PROPOSED WORK

Ariz., Flagstaff—FIELD HOUSE—Ariz. State College, T. D. Bellwood, pres., Flagstaff, plans completed by Lescher & Mahoney, Title & Trust Bldg., Phoenix, [illegible] field house. **$330,000.** Financing provided.

Ark., Blytheville—GAS SYSTEM—T. James & Co., Ruston, installing propane gas sys. **$250,000.**

★**California** — GAS PIPELINE — Southern California Gas Co., and Southern Counties Gas Co., 810 S. Flower St., Los Angeles, plans under way 214 mi. 26 in. natural gas pipeline between near Blythe and Santa Fe Springs. **$8,000,000.** Financing provided.

Calif., Elsinore — AIRPORT — G. Hunt, Elsinore, 2,500 ft. runway, 12 hangars, airport. Over **$150,000.** Approved by County Supervisors and CAA.

★**Calif., Long Beach**—DOCK—Long Beach Harbor Dpt., 1333 El Embarcadero, constructing 1,500 ft. dock at Long Beach Harbor. **$1,000,000.** R. R. Shoemaker, J. Amar, port mgr., 1333 El Embarcadero, engr.

Calif., Redondo Beach — RECREATION CENTER—City, City Hall, North Redondo Beach Recreation Center, constructing ball park, playground, water and comfort station installations. **$50,000.**

Calif., San Diego—AIRPORT—San Diego Aviation Service, J. M. Fitzhugh and [illegible] deSelm, 5828 Madison Ave., airport 3,000 ft. runway, 150 plane capacity, in Mission Valley on 140 acre site between Texas St. and Ward Rd. CAA. Over **$25,000.**

Calif., Seal Beach—RACE TRACK—A. Lanthier, K. Petillo, 433 Magnolia, Long Beach, automobile race track, 160 acre site on Garden Grove Blvd., at Bulsa Chica Rd. Over $25,000.

Conn., Bridgeport — PARKS, etc.—City Park Dpt., Sylvanus D. Locke, pres., Franklin Bldg., State St., boathouse alteration **$11,000,** greenhouse addn. **$15,000,** New Park Bridge, **$40,000,** all in Beardsley Park, constructing golf club **$75,000,** caddy house **$19,000,** in Fairchild-Wheeler Park, rifle range caretakers cottage, field house, music shell, tennis court, wading pool **$80,000.** Financing not provided. CD 2/24/44—ENR 3/9/44, under Postwar Projects.

Illinois — ELECTRIC SERVICE — Rural Electric Convenience Coop. Co., Divernon, exten. electric service, Sangamon Co. **$185,000.**

Ill., Chicago—PARK—Cook Co. Veterans Park Div., Chicago, park and recreation bldg. **$200,000,** incl. site. Bond election Jan. 21.

Ill., Freeport—AIRPORT RUNWAY SYSTEM—Freeport Airport, plans 95% completed, triangular runway sys., concrete paving, 3,232 ft. north and south runway, 2,803 ft. each, northeast and southwest runways, for maximum Class 2 airport. **$600,000.** Illinois Dpt. Aeronautics, 5 and Capitol Sts., Springfield, consult. engr. CD 12/20/44—ENR 1/25/45, under Postwar Projects.

Ill., Peoria—LIGHTING SYSTEM—Peoria Municipal Airport, contact lighting sys., **$45,000;** widening 2 runways, concrete, from 100 to 150 ft., northeast-southeast runway and east-west runway, **$95,000.** Financing not provided. Illinois Dpt. Aeronautics, 5 and Capitol Sts., Springfield, consult. engr.

Indiana—GAS LINES—Indiana Gas & Water Co., Franklin, C. R. Groves, regional engr., extend gas lines to Bloomington, Bedford and Martinsville, **$100,000** or more.

Indiana — ELECTRIC SERVICE — Parke County Rural Electric Membership Corp., Rockville, exten. electric service, Parke Co. **$305,000.**

Indiana—ELECTRIC SERVICE—Sullivan County Rural Electric Membership Corp., Sullivan, exten. electric service, Sullivan Co., **$160,000.**

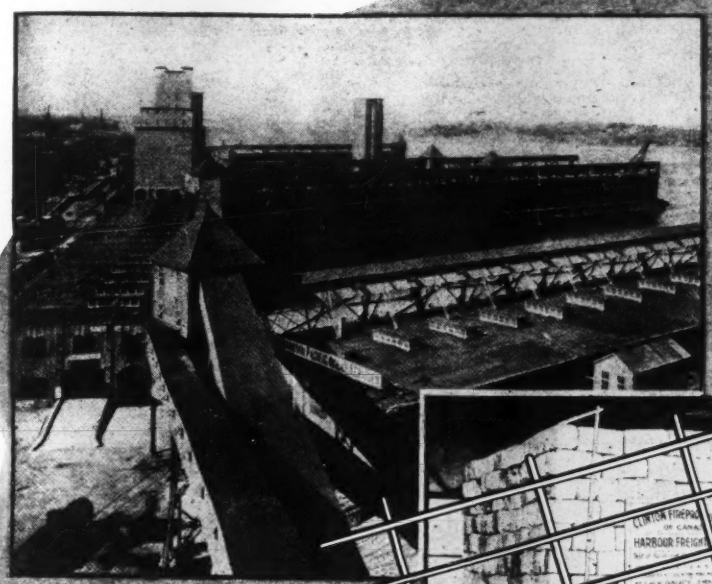
Ind., Roanoke—RADIO STATION TRANSMITTER, etc.—Westinghouse Radio Stations, WOWO Inc., 925 S. Harrison St., Fort Wayne, radio station transmitter and antenna. **$25,000** or more. Financing provided, plans incomplete. Legal obstacles to be overcome.

La., Alexandria—STADIUM—City plans by Robert & Staples, Guaranty Bank Bldg., Alexandria, concrete, steel stadium. **$65,000.**

La., Hermitage—PIPELINE—Gulf Refining Co., Maison Blanche Bldg., New Orleans, installing 5 in. water pipeline at depth of 1 ft. below bottom of Lake Hermitage.

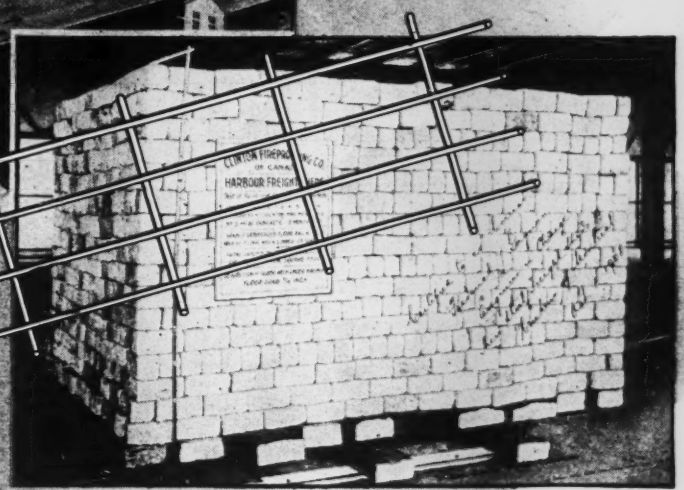
Kansas — TRANSMISSION LINES — Consolidated Gas Utilities Corp., Braniff Bldg., Oklahoma City, Okla., plans 70% completed 8 in. natural gas transmission line, near Erie, Neosho Co. **$70,000.** Financing provided.

✚**Me., Brunswick**—AIR FIELD BLDG.—Yards & Docks Annex, Navy Dpt., Arlington, Va., plans completed concrete, brick, steel crash truck garage at airfield, Contr. 13332, Spec. 17498.



The Harbor Freight Sheds at Montreal are of steel with floors and roofs of reinforced concrete.

In a test of the floor arches, made at age of 2 months, a 5" slab of 1-2-4 concrete 7 ft. wide reinforced with Clinton Fabric 4" x 12" mesh, Nos. 3 and 8 wire, was subjected to a load of 1650 lbs. per sq. ft. over an area of 24 feet. Deflection under this load was only 1/16 inch.



HARBOR IN THE HEART OF A CONTINENT

Situated a thousand miles from the ocean, the Harbor of Montreal, Canada, is the second port of North America. The Freight Sheds, which are capable of handling about 300,000 tons of cargo weekly, were built in 1908, and a total of 2,300,000 square feet of Clinton Electrically Welded Fabric was used for concrete reinforcement.

The test illustrated above, and scores like it in various types of structures, is indicative of the uniform, high tensile strength of Clinton Welded Fabric. More important is the fact that for over 35 years the Montreal Freight Sheds have withstood, not only the tremendous volume of freight handling, but sub-zero temperatures that necessitate closing of navigation for four months each winter.

Clinton Welded Fabric has been used in practically every type of reinforced concrete construction and today—43 years since its invention—it is still a leader in the field. It is supplied in rolls or sheets made and cut to specification for easy storage, handling and installation. For complete details write Structural Products Division, Wickwire Spencer Steel Co., 14 Lafayette Square, Buffalo 3, N. Y., or our nearest branch office.

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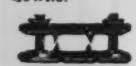

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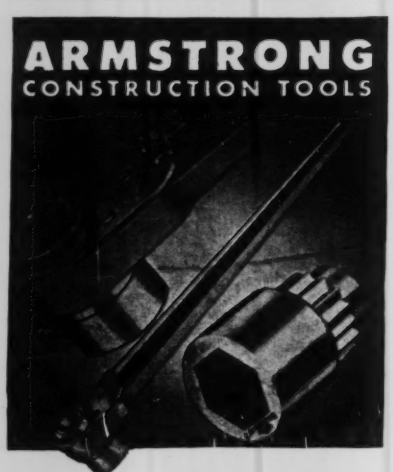

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UNCLASSIFIED (Proposed Work, Cont'd.)

Massachusetts—OIL PIPELINE—Colonial Beacon Oil Co., 30 Beacham St., Everett, oil pipeline under Merrimac River, between West Andover and Dracut. To exceed **$25,000.** Financing provided.

Mass., Haverhill — RADIO STATION — Haverhill Gazette Co., 179 Merrimack St., plans by C. Goodwin, 25 Washington Square, radio station, transmission station and studio, 300 ft. tower, Ayer Hill, Newton Rd. **$100,000.** Financing provided. CD 6/14—ENR 6/28, under Postwar Projects.

Mass., Marblehead—ATHLETIC FIELD—Town, Supt. Schools, expanding athletic field, at rear of high school. To exceed **$25,000.** Financing not provided.

Mich., Detroit—RIVERFRONT DEVELOPMENT—City, Dpt. P. Wks., City Hall, river front development from Randolph St., to Alter Rd., incl. river front drive, public passenger docks, park, yacht basins, marinas and relocation streets. **$28,000,000.** G. R. Thompson, City Hall, city engr.

Mich., Detroit — RADIO STATION — United Automobile Workers (C.I.O.) 411 Milwaukee Ave., 10kw. frequency modulation radio station. Approx. **$75,000.**

Minnesota—RURAL ELECTRIC TRANSMISSION LINES—Co-Operative Light & Power Assn. of Lake Co., Two Harbors, rural electric transmission line sys. imprvs., Lake Co., **$25,000** REA allot.

Minnesota — TRANSMISSION LINES — Meeker Co-operative Light & Power Assn., Litchfield, addnl. transmission lines and for acquisition, rehabilitation 32 mi. line, Meeker Co. **$211,000.** Banister Engrg. Co., 1547 University Ave., St. Paul, consult. engr. CD 11/13/44—ENR 12/14/44, under Postwar Projects.

Minn., Moorhead—PARK, etc.—City, R. G. Price, clk., park and recreation facilities. **$40,000.** H. V. Feehan, 1004 Marquette Ave., Minneapolis, landscape archt. CD 6/10/43—ENR 6/17/43, under Postwar Projects.

Mont., Shelby—AIRPORT—City, airport. **$30,000.** Financing not provided. H. E. Kirkemo, Lehsou Bldg., Missoula, archt. CD 1/8—ENR 2/8, under Postwar Projects.

Nebraska — TRANSMISSION LINES — Cedar-Knox Co. Rural PP Dist., Hartington, 250 transmission lines, Cedar Co. **$260,000.** Financing provided. H. J. Henningson, Standard Oil Bldg., Omaha, consult. engr. CD 7/27—ENR 8/2.

New Jersey—PARK IMPROVEMENTS—Palisades Interstate Park Comn., Bear Mountain, N. Y., plans completed demolition docks and boat basin, **$33,200;** plans under way truck trail, **$85,800;** trail shorepath to George Washington Bridge, **$22,000;** slope erosion control and landscaping, control drainage, **$76,500;** imprv. Ross Dock Area, **$20,200;** comfort station, **$65,000;** removing loose rock, **$88,700;** park roads, **$88,700,** all in Palisades Interstate Park. Bergen Co. Financing not provided. A. K. Morgan, Bear Mountain, ch. engr.

N. J., Atlantic City — BOARDWALK — Atlantic City, Dpt. P. Wks. City Hall, plans under way boardwalk reconstruction. **$400,000.**

N. J., Burlington—STADIUM—Bd. Educ., High School Bldg., plans by Micklewright & Mountford, 242 E. Hanover St., Trenton, concrete stadium, Proj. 1-28-P-201. **$160,000.** Financing not provided.

N. J., Mount Holly—PLAYGROUND IMPROVEMENTS — Bd. Educ. Mount Holly Twp., plans completed by H. O. Ziegler, 17 Washington St., Riverside, imprv. playgrounds of Junior and Brainerd St. Schools. **$28,347.** Financing not provided.

★**N. Y., Idlewild**—AIRPORT IMPROVEMENTS—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, plans completed, soon takes bids sludge loading dock and sludge tank, Contr. No. 3466, **$340,000;** placing hydraulic fill Contr. 2465, **$2,700,000,** both at Municipal Airport. Financing provided. J. Downer, 30 Rockefeller Plaza, New York, Zone 20, engr. CD 4/27/44—ENR 5/18/44, under Postwar Projects.

N. Y., New York—BATHING PAVILION—Dpt. Parks, Arsenal Bldg., Central Park, 64 St. and 5 Ave., Zone 21, plans completed, altering 2 story bathing pavilion at Orchard Beach, Pelham Bay Park, **$80,000.** Financing provided. A. Embury II, 150 E. 61 St., Zone 21, archt.

N. Y., Oneonta—FIRE ALARM SYSTEM—City, City Hall, plans completed, expan., reconstructing fire alarm sys. incl. 3 story fire drill tower. **$37,000.** Financing provided. Gamewell Fire Alarm Co., Newton, Upper Falls, Mass., consult. engrs. CD 11/1/44—ENR 11/16/44, under Postwar Projects.

N. Y., Rensselaer—ATHLETIC FIELD—City, City Hall, plans under way, high school athletic field. **$30,000.** A. G. Kaufman, Rensselaer, consult. engr. CD 8/16/44—ENR 9/7/44, under Postwar Projects.

N. Y., Rochester—PARKS—Comrs., Monroe Co., County Court House, Rochester, plans completed, imprv. 5 county parks, at Churchville, Ellison, Mendon Ponds, Powder Mill and Webster Parks. **$220,355.** F. H. Carroll, Div P. Wks., engr. CD 1/7/44—1/27/44 under Postwar Projects.

North Carolina — RURAL LINES—Union Electric Member Monroe, 200 mi. rural electric Co. **$211,000.** B. O. Vannort, Charlotte, consult. engr.

O., Fostoria—STADIUM—City H. L. Ford, supt., Fostoria, plan McLaughlin, Dominion Bldg., tic stadium. **$79,000.** Financing CD 12/3—ENR 12/13.

O., Minerva—STADIUM—School Boerner, pres., Minerva, football **$50,000.** Financing provided, plan plete.

O., Youngstown—STADIUM—C honing Co., Youngstown, stadiu 20,000 to 25,000 and large fi **$50,000** or more. Financing not p

O., Youngstown—UNDERGROUN —Ohio Bell Telephone Co., 101 W. St., addns. to underground and a lines in W. Rayen Ave. and F area; Hazelwood, Wilson, South, Madison, and Indianola Aves., Mar Elm, Charles, and LaClede Sts., Midlothian and Washington Blvds man and Meridian Rds. **$317,000.** ing provided.

Okla., Oklahoma City—TRAFFI TROL SIGNALS—City, City Hall **$46,000** bonds, addnl. traffic control R. Lee Jr., City Hall, city engr. CD

★**Okla., Oklahoma City**—PARK—C Hall, voted **$600,000** bonds, addn ational facilities in park sys. R. City Hall, city engr. CD 10/29—EN

Oklahoma — PIPELINE — Mid-Contin Petroleum Corp., 1st National Bank Bl Oklahoma City, plans 90% completed 6 in. crude oil pipeline from Moore to Okl homa City. Financing provided.

Oklahoma—ELECTRIC SERVICE—Ru Electric Co-operative, Inc., Lindsay, exte electric service, Garvin Co., **$50,000.**

Okla., Okeene—AIRPORT—City of Okee plans airport. **$25,000.** Financing not pro vided. Pate Engineering Co., Daniels Bld Tulsa, consult. engr.

Ore., Portland — TERMINAL — Portland Dock Commission, Foot of N.W. 14, termin #2 in Willamette River. **$100,000.** A. E Merrill, Portland Dock Com., engr.

Okla., Woodward—PARK—City, City Hall voted **$26,000** bonds, addnl. park facilitie Alexander & Pollard, Terminal Bldg., Okl homa City, consult. engrs. CD 11/12.

Pa., Berwyn—ATHLETIC FIELD—Tredyf frin Easttown Twp., Joint School Bd., W. Latch, pres., Berwyn, surveys under wa athletic field. **$25,000** or more.

Pa., Ellwood City—SWIMMING POOL— Ellwood City Boro, 525 Lawrence Ave swimming pool, incl. dressing roo showers, lockers and filtration plant. **$100,000.**

Pa., Lebanon—AIRPORT—Central Pen Aero Sales, Inc., Lebanon, airport. $25,00 or more.

Pa., New Kensington—School Dist. of Ne Kensington, plans by E. Cooke, 316 Charle St., 1 story, 35x160, shower bldg., stee bleachers seating 5,000. **$90,000.**

★**Pa., Phila.**—PARK—Commonwealth o Pennsylvania, J. U. Shroyer, hy. secy Harrisburg, creating national park at Inde pendence Hall. **$4,000,000.**

Pa., Phila.—RADIO STUDIOS, etc.—Radio Station WIP, 35 S. 9 St., plans by Silverman & Levy, 1411 Walnut St., radio and tele vision studio addns. **$350,000.** Financing provided.

Pa., Phila.—SEAPLANE BASE—W. H. Nicolai, Jr., 2069 N. 63 St., seaplane base **$25,000.**

Pa., Phoenixville—AIRPORT—J. H. Welch Phoenixville, airport. **$25,000** or more.

R. I., Coventry—ATHLETIC FIELD— Town of Coventry, Bd. of Selectmen, Town Hall, plans high school athletic field. **$35,000.** Financing not provided. Jenks and Ballou, 2600 Industrial Trust Bldg., Providence, consult. engrs.

South Carolina—ELECTRIC SERVICE— Marlboro Electric Cooperative Inc., Bennettsville, exten. electric service, Marlboro, **$196,000.**

South Dakota—ELECTRIC SERVICE— Hamlin Electric Assoc., Hayti, exten. electric service, Hamlin Co. **$100,000.**

S. D., Yankton—PARK, SWIMMING POOL —City, voted **$100,000** bonds recreational park and swimming pool. Wm. Beutler, Insurance Exchange Bldg., Sioux City, Ia., archt. Buell & Winter, Insurance Exchange Bldg., Sioux City, Ia., consult. engrs. CD 11/2—ENR 11/29.

Tennessee—ELECTRIC SERVICE—Forked Deer Electric Cooperative, Inc., Halls, exten. electric service, Lauderdale Co. **$262,000.**

Texas—RURAL TRANSMISSION LINES— Rural Electric Co-operative, Lindsay, plans 90% completed rural electric power transmission lines, Cooke Co. **$50,000.** Financing provided.

Tex., Austin — PARK — City, T. Miller, mayor, City Hall, establishment of park around lake created by proposed dam.

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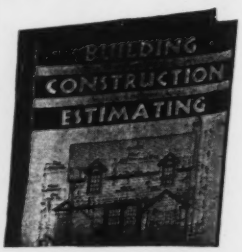

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UNCLASSIFIED (Proposed Work, Contracts) **$75,000.** Financing not provided. J. Montgomery, Littlefield Bldg., consult. engr.

Tex., Bay City—RECREATION FACILITIES—S. E. Doughtie, mayor, City Hall, plans under way, recreation facilities. **$35,000.** S. A. Russell & H. S. Houston, Bay City, consult. engrs.

Tex., Beaumont—AIRPORT—City, City Hall, airport imprvs., incl. imprv., expanding runways, drainage, taxiways. **$200,000.** Financing not provided. G. Schuamburg, City Hall, engr. CD 1/17—ENR 3/22, under Postwar Projects.

Tex., Beaumont — STADIUM — Memorial Assn., c/o Dr. J. Clark, Beaumont, memorial stadium. **$75,000.** Financing not provided.

★**†Tex., Beaumont** — STORAGE BASE — Yards & Docks, Navy Dpt., Arlington, Va., large storage base for idle oil tankers and other ships. **$2,000,000.**

Tex., Boerne—GAS DISTRIBUTION SYSTEM—City, City Hall, plans 20% completed, natural gas distr. sys. **$75,000.** Financing provided. Austin Engrg. Co., 203 Rivers Dr., Austin, consult. engr. CD 10/23—ENR 11/15.

★**Tex., Dallas**—AIRPORT—City, City Hall, voted bonds, airport. **$1,000,000.** CD 11/5—ENR 11/29.

★**Tex., Dallas** — COLISEUM, etc. — City, City Hall, voted bonds, coliseum, **$2,000,000;** parks and playgrounds, **$2,500,000;** electric traffic control sys., **$275,000.** CD 11/5—ENR 11/29.

Tex., Dallas—AIRFIELD—Maj., J. A. Hudson, 3414 Shore Crest, airfield for private enterprise, incl. 2,500 ft. runways, **$100,000.** Financing not provided.

★**Tex., Dallas**—PARKING SYSTEM, etc.—L. R. Whitson, et al, Mercantile Bank Bldg., plans under way 6,000 car capacity super parking sys., incl. subway and tunnel. **$500,000.** Financing provided.

Tex., Dallas—STREET LIGHTING—City, City Hall, voted bonds, outside electric street lighting. **$250,000.** CD 11/5—ENR 12/13.

Tex., Donna — PIPELINE CARRIER — South Texas Pipe Line Co., Donna, plans 90% completed 18 mi. 8 in. crude oil pipeline carriers, **$70,000.** Financing provided.

★**Tex., Fort Worth**—TELEPHONE SYSTEM IMPROVEMENTS — Southwestern Bell Telephone Co., 821 Telephone Bldg., Dallas, plans 50% completed telephone sys. imprvs., incl. lines, conduits, etc., **$2,500,000.** Financing provided, C. W. Mier, 821 Telephone Bldg., Dallas, ch. engr.

Tex., Garwood—RADIO STATION—Garwood Irrigation Co., Garwood, plans 75% completed radio station, **$25,000.** Financing provided.

Tex., Houston—RADIO TELEPHONE STATION—Southwestern Bell Telephone Co., 1121 Capital St., plans 50% completed experimental land radio telephone station. Over **$40,000.** Financing provided.

Tex., Houston—AIRPORT—Glen H. McCarthy, Sterling Bldg., airport on 460 acre site just purchased. Over **$150,000.** Financing provided.

Tex., Lubbock — STADIUM — Texas Technological College, Lubbock, plans by W. C. Hedrick, 1005-1st National Bank Bldg., rein.-con. stadium. **$300,000.** Financing not provided.

Tex., Pharr—AIRFIELD—R. Boland, McAllen, commercial airfield, incl. 130x160 ft. hangar, airplane repair shop, preparing field for taking off and landing, etc. **$100,000.** Financing provided.

Tex., Pharr—PARK—City, (sponsored by Chamber of Commerce), park. **$25,000.** Financing not provided.

Tex., San Angelo—AIRPORT—City, City Hall, plans under way airport, incl. imprv. old army airfield, incl. hangar, shop, storage, etc. **$100,000.** Financing not provided. J. P. Burden, City Hall, engr. CD 1/18—ENR 3/22, under Postwar Projects.

Tex., San Angelo—ELECTRIC LIGHTING SYSTEM—City, City Hall, modern street electric lighting sys. **$35,000.** Financing not provided. J. P. Burden, City Hall, engr.

Va., Norfolk — AIRPORT BLDG. — City, City Hall, airport administration bldg. **$206,900.**

Wisconsin — ELECTRIC DISTRIBUTION SYSTEM—Crawford Electric Co-Operative, Grays Mills, electric distr. sys., REA Proj. Wisc.-52-Crawford, Crawford Co. **$117,000.** Wisconsin Electric Co-Operative, 303 E. Wilson St., Madison, Zone 3, consult. engr. CD 11/9.

Wis., Milwaukee—PARKING STATION—Gimbel Bros., 101 W. Wisconsin Ave., Zone 3, 2 or 4 deck 200x200 ft. or 200x220 ft., rein.-con. parking station. Drolshagen & Boynton & Assoc., 647 W. Virtini St., Zone 4, archts. and consult. engrs.

Alberta and Saskatchewan—RAILWAY — Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, Que., completing 95 mi. railway, Bonnyville, Alta. to St. Walburg, Sask.

★**B. C., Victoria**—POWER DEVELOPMENT—B. C. Power Comn., S. R. Weston, chn., power development on Campbell River, incl. dam at Trout Pool, below Elk Falls, dam at Irene Pool above Elk Falls, 12 ft. conduit, surge tank, 2 penstocks. **$3,700,000.** H. G. Acres & Co., 435 Culp St., Niagara Falls, Ont., engr. CD 9/27—ENR 10/18.

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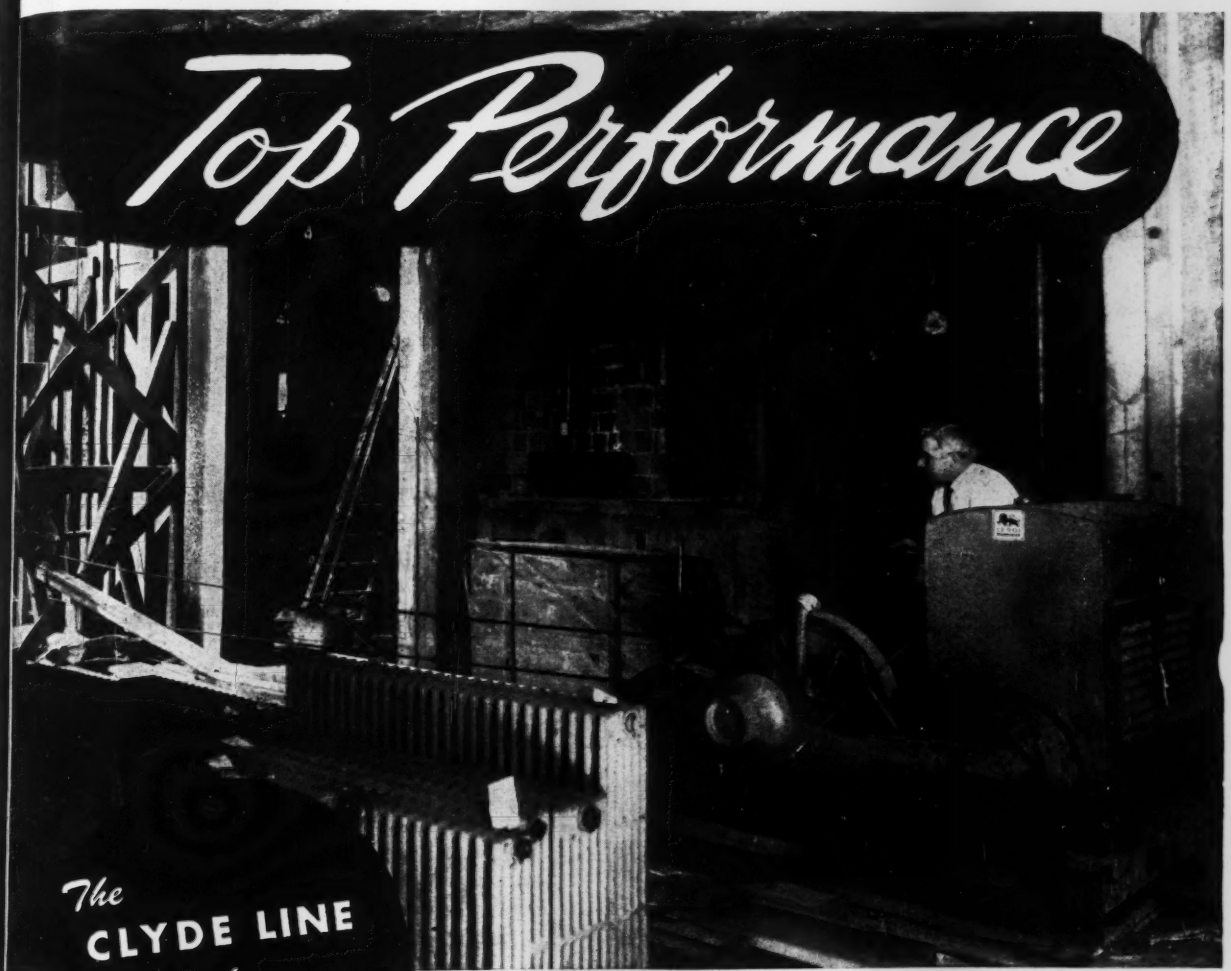

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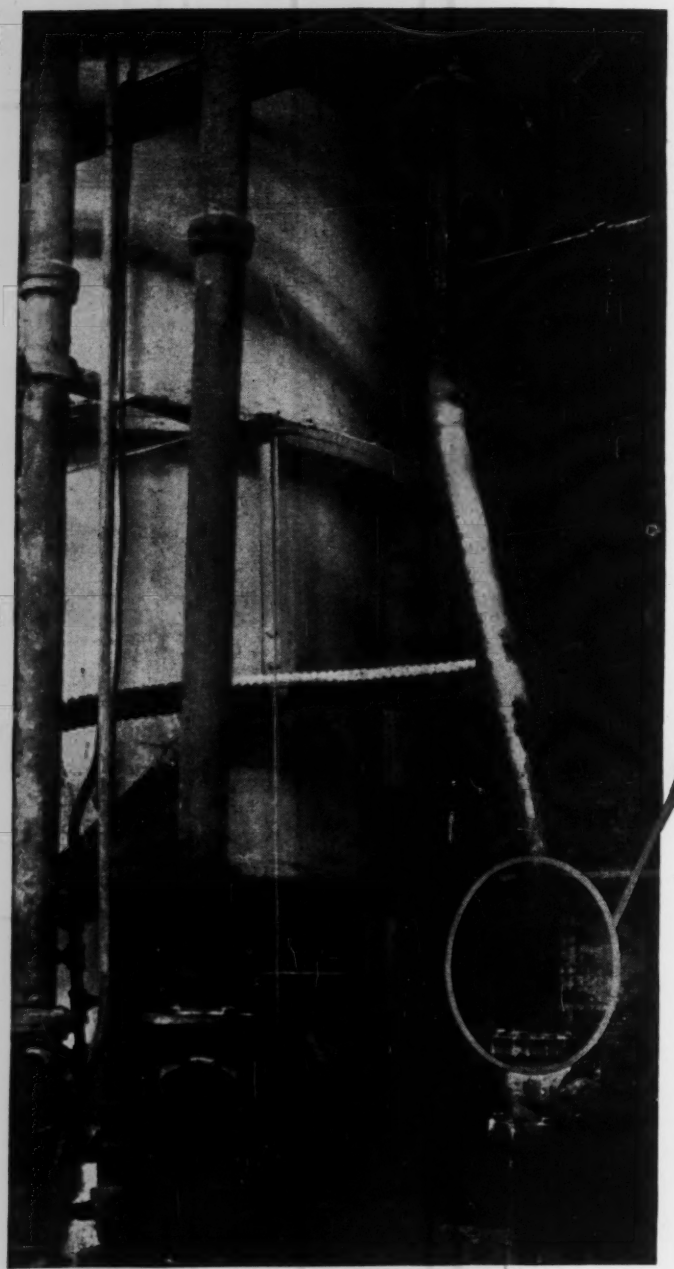
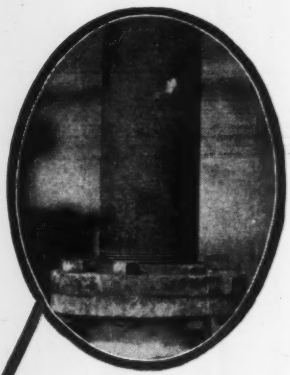


Salt-encrusted equipment at the Ohio Salt Co. plant at Wadsworth, Ohio. The tail-water pipe, spotlighted where it enters the shutoff valve and magnified at the right above, is Yoloy, furnished by Hardware and Supply Company, Akron, Ohio.



Portrait of Yoloy
Resisting a 3-Year Salt Attack

THIS Yoloy pipe has been in daily service in a corrosive salt atmosphere for over three years. It is the tail-water line handling condensate from the vacuum pan of a salt evaporator.

To the left you see the equipment "as is," encrusted with 3 years' accumulation of salt. Much of the piping, valves, tank, etc., is badly corroded.

Above is a closeup of the Yoloy pipe after the salt was removed. Note that it retains its perfection of threads, in fact, has the appearance of new pipe. That's because Yoloy is a nickel-copper steel, its remarkable ability to resist corrosion demonstrated in hundreds of instances like this.

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CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *DARWIN R. DAY, Statistics* *J. A. MAHONEY, Reports*

(Daily service also available—Write for details)

WATER SUPPLY

BIDS ASKED

Bids Asked January 3

D. C., Wash.—District Comrs., District Bldg., 7,610 ft. 30 in. and 4,240 ft. 24 in. watermain from 18 St. and Minnesota Ave. S.E. to Benning Rd. and East Capital St.

Bids Asked January 7

Calif., Altadena—A. L. Sonderegger, engr., 925 Central Bldg., Los Angeles, installing 8,070 ft. 12- to 18-in., steel watermains, etc., for Rubio Canyon Land & Water Assn., 583 E. Sacramento St. $20,000. Plans deposit $20.

LOW BIDDERS

Fla., Sarasota—City, City Hall, rejected bids Nov. 29, water sys. addns., imprvs. CD 11/15—ENR 11/22.

CONTRACTS AWARDED

†D. C., Wash.—Yards & Docks Annex, Navy Dpt., Arlington, Va., underwater calibration facilities at Bancroft Reservoir, N.O.L., NOY 12120, to Eugene Simpson & Bro., 2 W. Walnut St., Alexandria, Va. **$78,850.**

Ia., Muscatine—City, City Hall, c.i. waterpipe, to American Cast Iron Pipe Co., Fidelity Bldg., Kansas City, Mo., **$29,000**; installation to Elmer Gust Co., Oshkosh, Wis. **$25,014.** CD 11/2—ENR 11/29.

La., Turnerville—Water Dist. 1, Iberville Parish, Turnerville WW sys., to Hebert Bros., Plaquemine. **$38,431.** Bids 12/11. CD 11/21—ENR 11/29.

Ont., Ottawa—Dpt. P. Wks., Ottawa, installing fire mains, hydrants, related work at Royal Canadian Mounted Police btrracks at Rockcliffe near here, to W. G. Edge Co. Ltd., 150 Gloucester St., about **$21,000.**

SEWERS, WASTE DISPOSAL

BIDS ASKED

Bids Asked About January 15

O., Toledo—City Div. Sewage Disposal, J. H. Jewhurst, city serv. dir., 1 story, 25x50 ft., brick detritor bldg. addn. and 1 story, 20x40 ft., brick grease removal bldg. at city sewage disposal plant and equip. $150,000. Jones & Henry, Toledo Trust Bldg., engrs. CD 3/16/44—ENR 4/6/44, under Postwar Projects.

LOW BIDDERS

†Calif., Mare Island—Yards & Docks Annex, Navy Dpt., Arlington, Vt., reserve fleet berthing dredge spoil discharge line and altering sewer outfalls at Navy Yard, Spec. 17362, NOY 13192, from Paris Bros., 2415 Oregon St., Berkeley. **$60,757.** CD 11/9—ENR 11/15.

Minn., Duluth—City, C. D. Jeronimus, clk., City Hall, rejected bids Nov. 26, relief sanitary sewer, 21 Ave. W. from Michigan St. to the Bay and 1 addnl. sluice gate, 22 Ave. W., near Michigan St. L.B. **$33,089.** CD 12/12—ENR 12/20, under LB.

†Tex., Corpus Christi—Yards & Docks Annex, Navy Dpt., Arlington, Va., project abandoned, imprv. sewage disposal plant, facilities. Over **$25,000.** CD 8/16—ENR 8/23.

CONTRACTS AWARDED

†Va., Quantico—Yards & Docks Annex, Arlington, imprv. sewerage sys., Brown Field Marine Corps Air Station, NOY 12988 to W. G. Cornell, Inc., of Washington, 1003 K St. N.W., Wash. D. C. **$52,750.** CD 11/9—ENR 11/15.

BRIDGES

Bids Asked January 4

Kansas — State Hy. Dpt., McPherson, **Bridge 4.5**, rein.-con. slab spans, FA 185 D (4); **Bridge 4.9**, rein.-con. box, FA 185 D (4); **Bridge 6.9** FA 184 D (4), Cloud Co.; **Bridge 2.3**, rein.-con. box, Proj. FA 278 B (4), **Bridge 1.1**, FA 278 B (4); Bridge 0.6, FA 278 B (4); Bridge 13.3, FA 278 F (4); Bridge 10.7, FA 278 F (4); Bridge **10.6**, FA 278 F (4); Bridge 8.4, FA 278 F (4); Bridge 7.3, FA 278 F (4); Bridge **6.3**, FA 278 F (4); Bridge 5.5, FA 278 F (4); Bridge 3.6, FA 278 F (4); Bridge 14.1, rein.-con. spans, FA 278 F (4); widening spans Bridge 10.8 FA 278 F (4); Bridge 10.4, FA 278 F (4), all foregoing McPherson Co.; steel beam span Diamond Creek Bridge, FASW 3 (1), Morris Co.; rein.-con. slab Bridge 22, FA 44 A (6); Bridge 22.5, three 23 ft. timber spans, FA 44 A (6); Bridge 21.3, FA 44 B (6); Bridge 21.5, FA 44 B (6); Bridge 23.5, FA 69 A (3), all foregoing Saline Co. R. C. Keeling, Topeka, engr.

Location of ENR Correspondents

Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads); BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Bids Asked January 16

California—State Div. Hys., Sacramento, structure over Bay Shore Freway at Peninsular Ave., San Mateo Co.; 5 rein.-con. slab bridges, widening 2 bridges between Los Molinos and Red Bluff, Tehama Co. G. T. McCoy, state hy. engr. CD 10/2—ENR 10/11.

LOW BIDDERS

Missouri—State Hy. Comn., Jefferson City, rejected bids Nov. 30, culverts, Barry Co. L. B. **$11,495**; bridges, Wayne Co. L. B. **$6,458**; St. Genevieve Co. L. B. **$4,471**; Polk Co. L. B. **$38,215**; Wayne Co. L. B. **$8,822.** CD 11/8—ENR 11/15.

SOON LETS CONTRACT

Pa., Parker Ford—Pennsylvania R. R., J. L. Gressitt, ch. engr., Broad St. Station Bldg., 1617 Pennsylvania Blvd., Phila., 4, soon lets contract railroad bridge. **$25,000** or more.

LOW BIDDERS

California — State Div. Hys., 808 State Bldg., Los Angeles, Dec 13, 2 rein.-con. girder bridges San Diego Co., from Spencer Webb, 1111 N. Sycamore Ave., Los Angeles, **$195,313**; steel beam bridge, approaches, San Diego Co., from W. H. Barber, P. O. Box 1523, San Diego, **$74,794.** G. T. McCoy, 808 State Bldg., Los Angeles, engr. CD 11/26—ENR 11/29.

★**Florida**—State Road Dpt., Tallahassee, Dec. 13, bridge over Indian River, Brevard Co., from Cleary Brothers Constr. Co., West Palm Beach, **$689,612**; bridge across Suwanee River, Lafayette Co., from L. J. & W. L. Cobb Constr. Co., 1102-22nd St., Tampa, Zone 1, **$415,509.** CD 11/30—ENR 12/6.

CONTRACTS AWARDED

★**†Calif., Terminal Island**—Yards & Docks Annex, Navy Dpt., Arlington, Va., vertical lift bridge over Cerritos Channel, Spec. 17365, NOY 13195, to United Contract Pipe Corp., 1347 W. 208 St., Los Angeles, **$5,299,000.** CD 10/29—ENR 11/1, under LB.

Missouri—State Hy. Comn., Jefferson City, I-Beam span bridge, Pettis Co., to O. W. Knutson, 3527 Bway., Kansas City, **$35,237**; rein.-con. arch span bridge, Iron Co., to M. E. Gillioz, Monett, **$113,718.** Bids 11/30. CD 11/8—ENR 11/15.

STREETS AND ROADS

BIDS ASKED

Bids Asked January 4

Kansas—State Hy. Dpt., McPherson, grading, concrete paving 3.378 mi. Proj. FA 278 B (4); 11.569 mi. FA 278 F (4); surfacing for detours 9.35 mi. FA 278 E (4), all foregoing McPherson Co.; grading 0.678 mi. FAS 163 (1), Morris Co.; resurfacing material 7.026 mi. Proj. 2643 and 4.007 mi. Proj. 2674, Clay Co. R. C. Keeling, Topeka, engr.

Nevada—Directors State Dpt. Hys., Carson City, constructing 6.589 mi. State Hy. System, from Junction with U. S. 50, 5 mi. west of Fallon, to approx. 8 mi. southeasterly on portion of FAS Routes 505, 506 and 504, Churchill Co. Plans deposit $10, $5 refunded.

Bids Asked January 8

Ohio—State Hy. Dpt., Columbus, grading, drainage structures, traffic bound surface paving 0.539 mi. and constructing 2 steel beam bridges over West Fork of Little Beaver Creek Columbiana Co.; grading, drainage structures, bituminous surface treatment paving 0.653 mi. and 2 steel beam bridges over branch of Sycamore Creek on S. H. 718, Fairfield Co.; grading constructing dump rock fill 1.069 mi. S. H. 790, 392, Noble Co.; grading, drainage structures, bituminous road mix surface course 0.274 mi. building steel beam bridge spans over Sandy Run. Vinton Co.

Bids Asked January 16

California—State Div. Hys., Sacramento, grading, concrete paving 3.8 mi. road between Grant line Rd. and Mossdale, San Joaquin Co.; grading, road mix surfacing 1.5 mi. road between 5th Standard Parallel south and 1.5 mi. north, Kings Co.; 7.1 mi. road between 6 mi. north of Red Bluff and Shasta Co. line, Tehama Co., 3.3 mi. road and rein.-con. bridge across Cortina Creek, between 3 mi. north of Arbuckle and 4 mi. south of Williams, Colusa Co. G. T. McCoy, state hy. engr.

LOW BIDDERS

California — State Div. Hys., 808 State Bldg., Los Angeles, Dec. 13, imprv. 2.8 mi. San Bernardino Co., from Matich Bros., P. O. Box 390, Colton. **$309,541.** Est. $356,000. CD 11/26—ENR 11/29.

Calif., Long Beach—City, City Hall, asphaltic concrete on crusher rim paving Los Coyotes Diagonal-Traffic Circle to Bellflower Blvd., from Bryce Trucking & Constr. Co., 1306 E. Anaheim St., Wilmington. **$28,967.** Est. 29,700. CD 12/12.

D. C., Wash.—District Comrs., District Bldgs., Dec. 13, repaving asphaltic pavement and concrete bases East section, from McGuire & Rolfe, Inc., 1 and O Sts. S.E., **$161,000.** CD 12/10.

Florida — State Road Dpt., Tallahassee, Dec. 13, imprv. 8.248 mi. Liberty Co., from C. C. Moore Constr. Co., Panama City. **$194,213.** CD 12/10.

Missouri—State Hy. Comn., Jefferson City, rejected bids Nov 30, imprv. 4.256 mi. Marion Co. L. B. **$37,882**; 0.173 mi. Marion Co. L. B. **$1,116**; 2.231 mi. Marion Co. L. B. **$18,933**; 1.425 mi. Polk Co. L. B. **$24,311**; 0.689 mi. Perry Co. L. B. **$146,804**; 1.257 mi. Morgan Co. L. B. **$9,782**; 3.087 mi. Morgan Co., L. B. **$15,659**; 2.606 mi. Morgan Co. L. B. **$18,240**; 2.02 mi. Morgan Co. L. B. **$15,499**; 2.94 mi. Wayne Co., **$32,417**; 4.876 mi. Ste. Genevieve Co. L. B. **$45,077.** CD 11/8—ENR 11/15.

Vermont—State Hy. Dpt. Montpelier, Dec. 14, imprv. 0.555 mi road in Hartford, from Lambert & George, Montpelier, **$111,408.** CD 12/6; 0.331 mi. Enosburg, from R. F. Carpenter, Alburg, **$44,213.** CD 12/7.

Virginia—State Hy. Dpt., Richmond, Dec. 18, imprv. 0.351 mi. Fairfax Co., from R. T. Main, Jr., Roanoke, **$70,064.** CD 12/10—ENR 12/13.

CONTRACTS AWARDED

Missouri—State Hy. Comn., Jefferson City, to Cameron-Joyce & Co., Keokuk, Ia., imprv. 4.997 mi. Franklin Co. **$78,124**, 4.933 mi. Franklin Co. **$77,148**, 4.663 mi. Gasconade Co. **$77,951**; to M. E. Gillioz, Monett, 0.567 mi. Iron Co. **$46,508**, 0.392 mi. Iron Co. **$26,524.** Grand total $306,255. Bids 11/30. CD 11/8—ENR 11/15.

Que., Ste. Anne De Bellevue—Dpt. P. Wks., Ottawa, Ont., constructing roadway at Military Hospital, to Local Constr. Co., Ltd., 4740 Iverville St., Montreal. **$36,977.**

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EARTHWORK, WATERWAYS

BIDS ASKED

Bids Asked January 4

†Oklahoma—Bureau Reclamation, Court House, Denver, Colo., earthwork, structures, Station 376 plus 87.5 to Station 610 plus 00, Altus Canal and Altus Laterals 2.8 to 9.9 and sublaterals, Altus Proj., Spec. 1132. Extended date. CD 12/10—ENR 12/13.

Bids Asked January 25

†Nevada — Bureau Reclamation, Court House, Denver, Colo., ventilating and air-cooling equip. for installation in Boulder Power Plant, Boulder Canyon Project, Arizona-California-Nevada, Spec. 1141.

Bids Asked

Ont., Harrow—W. G. Baldoni, clk., Colchester South wp., Harrow, excavating open cut-Richmond Drain. $20,000. C. G. R. Armstrong, Bartlett Bldg., Windsor, engr.

LOW BIDDERS

†Louisiana—U. S. Eng., foot of Prytania St., New Orleans, Dec. 10, approx. 137,000 cu. yd. uncompacted fill on South Bank Red River Levee below Moncal, Avoyelles Parish, Inv. 16-047-46-67, from Cleal T. Watts, Rochdale, Miss. **$25,893.**

Minn., Mankato—Blue Earth Co., N. E. Lee, aud., received no bids Dec. 4, tile work on County Ditch 77. **$21,890.** Will readvertise. D. E. Engwalson, co. hy. engr. CD 11/28—ENR 10/4.

CONTRACTS AWARDED

Mass., Winthrop—Commonwealth of Massachusetts, 20 Somerset St., Boston, Dec. 13, emergency repairs to Winthrop Shore Reservation, to Walter Reed Corp., Boylston St., Boston. **$20,150.** Bids 12/13.

Minn., Gaylord—Sibley Co., W. C. Oldenburg, aud., 91,664 cu. yd. excav., leveling earth banks, etc., County Ditch 15, to A. A. Graupman, Hamburg. **$15,166.** Bids 11/14. CD 11/8.

Ont., Toronto—Dpt. P. Wks., Ottawa, groynes, adjacent to south face for Toronto Island Breakwater, Toronto Island, to Russell Constr. Co., Ltd., Harbaur Comn. Bldg. **$35,598.**

LATIN AMERICA

Mexico, Mexico City—R. Gomez, mayor, Federal Dist., Mexico City, will construct milk dehydration plant, by own forces. **$600,000.**

Mexico, Tamacoco—War Dpt., Mexico City, will construct war material plant, mfg. hand grenades, bombs, artillery, ammunition, etc for national army, by own forces. **$500,000.**

PUBLIC BUILDINGS

BIDS ASKED

Bids Asked January 3

Fla., Jacksonville—A. N. Sallee, engr. Duval Co. Comn., 80x190 ft., concrete block warehouse.

Bids Asked January 7

★ **Tex., Velasco, Lake Jackson and Clute**—Brazosport Ind. School Dist., Angleton, 12 room school, at Velasco, $200,000; 12 room school, Lake Jackson, $200,000; school addns., imprvs., at Clute, $150,000. Extended date. Plans deposit $50 for general plans $25 each for mechanical and electrical plans. A. B. Dow, 2210 Commerce Bldg., Houston, archt. CD 11/26—ENR 11/29.

Bids Asked January 15

Pa., Schuylkill Haven—Boro, E. J. Gerhard, secy., Town Hall, electric light and power plant. $300,000 incl. equip. Tentative date. L. T. Klauder, Lincoln Liberty Bldg., Phila., engr. CD 9/7—ENR 9/13, under BA.

SOON LETS CONTRACT

Minn., Crookston—State Bd. Regents University of Minnesota, R. C. Callaway, purch. agt., Administration Bldg., Minneapolis, 2 story, bsmnt., brick, tile, girls dormitory at Northwest School of Agriculture & Experiment Station, to H. L. Stavn Co., Hibbing. **$150,700.** C. H. Johnston, 715 Empire Bank Bldg., St. Paul, archt. CD 11/14.

LOW BIDDERS

D. C., Wash.—District Comrs., District Bldg., Dec. 18, altering service bldg. for laundry at Gallinger Municipal Hospital from J. B. Bahen, 3736 10 St. N.E. **$82,900.** CD 12/3—ENR 12/6.

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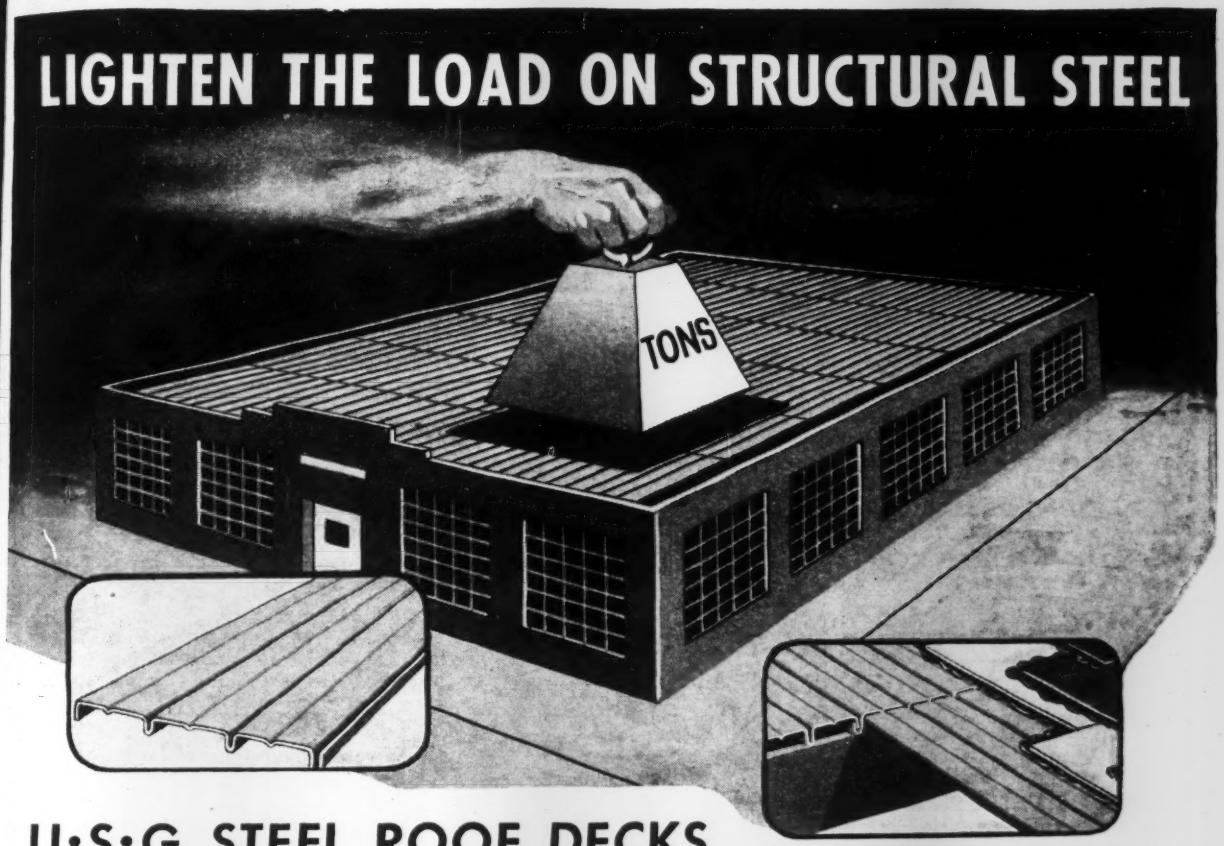

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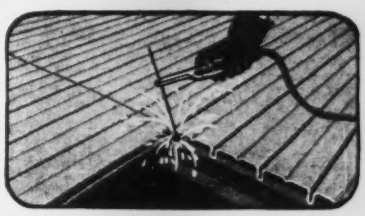

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PUBLIC BUILDINGS (Cont'd.)

CONTRACTS AWARDED

N. M., Las Cruces—U. S. Eng., 4 and Gold Sts., Albuquerque, 112x180 ft., steel industrial bldg., electric lines, fence, concrete apron, roads, to C. H. Leavell & Co., 1900 Wyoming St., El Paso, Tex. **$153,797.**

Ont., Burlington—Dpt. Veteran's Affairs, Veterans Land Act., 465 Bay St., Toronto, 47 houses, to Yates Constr. Co. Ltd., 400 Wellington St. N., about **$200,000.**

Ont., Hamilton—Dpt. Veteran's Affairs, Veterans Land Act, 465 Bay St., Toronto, 43 houses in Ancaster Twp., to Yates Constr. Co., Ltd., 400 Wellington St. N., about **$185,000.**

COMMERCIAL BUILDINGS

BIDS ASKED

Bids Asked After January 1

D. C., Wash.—St. Ann's Roman Catholic Church, Rev. Henry D. Collins, pastor, 440 Wisconsin Ave. N.W., church. $200,000. Henry D. Dagit & Son, 1329 Race St., Phila., Pa., archts. CD 11/29/44—ENR 12/14/44, under Postwar Projects.

Bids Asked January 4

O., Akron—St. Paul's Roman Catholic Church, 412 Palmetto St., 3 story, bsmnt., 60x108 ft., brick school. $150,000. G. W. Stickle, 3870 Carnegie Ave., Cleveland, archt. CD 12/12—ENR 12/20.

Bids Asked January 5

Tex., Fort Worth—W. C. Hedrick, archt., 1005 1st National Bank Bldg., 3 story, brick, 38x230 ft., boys dormitory, for Texas Christian University, Fort Worth. P. M. Geren, W. C. Hedrick, and J. R. Pilich, 1st National Bank Bldg., archts. CD 11/28—ENR 12/6.

Bids Asked January 10

S. C., Goldville—Joanna Textile Mills, Goldville, housing. W. Irwin, Augusta, Ga., archt. CD 9/28—ENR 10/11, under Industrial.

Bids Asked

Pa., Phila.—T. H. Moran, archt., 2793 N. Main St., Lawrenceville, N. J., residential development, for A. C. Cochran Estates, Yardley. $280,000.

CONTRACTS AWARDED

Calif., Los Angeles—Mullen & Bluett, 600 S. Broadway, 3 story and 7 story tower, 135x168 ft., rein.-con. store, Wilshire Blvd. and Ridgley Dr., to L. E. Dixon Co., 609 S. Grand Ave. About **$250,000.** Stiles Clements Associated Architects & Engineers, Van Nuys, archts. CD 4/5—ENR 4/19, under Postwar Projects.

Ga., Atlanta—Sears Roebuck & Co., 675 Pdel. Ave. N.E., 4 story, 121x180 ft., brick commercial bldg. addn., to Beers Constr. Co., Ellis St. Est. **$150,000.** Nimmons Carr & Wright, 333 N. Michigan Ave., Chicago, Ill., archts.

Ia., Sioux City—S. S. Kresge Co., 423 E. 4 St., store, to W. A. Klinger Co., Inc., 201 Warnock Bldg. **$450,000.**

★ **Minn., Minneapolis**—Dayton Co., 700-40 Nicolle Ave., general contract addnl. concrete, steel store floors, to C. F. Haglin & Sons, Inc., 720 National Bldg. Total est. **$1,000,000.** Larson & McLaren, 1901 Foshay Tower, archt.

Minn., St. Paul—College of St. Thomas, Very Rev. V. J. Flynn, pres., Cleveland and Summit Aves., general contract 4 story, 65x120 ft., rein.-con. Mankato stone, bedford trim, science bldg. on college campus, facing Summit Ave., to McGough Bros., 1951 University Ave., St. Paul. **$400,000.** Ellerbe & Co., E. 1021 First Natl. Bank Bldg., archt.

Nev., Las Vegas — Gregson Bautzer & Assoc., 6253 Hollywood Blvd., Hollywood, Calif., and Las Vegas, casino and hotel on main highway west of here, incl. 40x80 ft. swimming pool, to E. A. Ralston, 6669 Sunset Blvd., Hollywood, Calif. About **$250,000.** G. V. Russel, 3275 Wilshire Blvd., Los Angeles, Calif., archt.

★ **N. C., Greensboro**—Sears, Roebuck & Co., S. State and E. Van Buren Sts., Chicago, Ill., brick, steel, concrete mail order house, Lawndale Dr., to J. A. Jones Constr. Co., 209 W. 4 St., Charlotte. **$2,000,000** or more. CD 11/21—ENR 12/6.

O., Akron—St. Matthews Catholic Church, 389 Canton Rd., 1 story, bsmnt., church, to J. Ruhlin, 175 N. Highland Ave. **$150,000.** Awarded 12/15. Kraus & Helmkamp, 1st Central Tower, archts.

★ **O., Cleveland**—Sears Roebuck & Co., 8501 Carnegie Ave., two 3 story, bsmnt., brick store addns., one 75x136 ft., other 106x118 ft., also 1 story, bsmnt., 48x155 ft., brick service station, 10900 Lorain Ave., to Sam W. Emerson Co., 1836 Euclid Ave. **$590,000.** CD 12/1/44—ENR 12/14/44, under Postwar Projects.

O., Cleveland—A. Visconsi, Hickox Bldg., 1 story, 125x140 ft., brick, stone, steel shopping center bldg., Snow and Ridge Rds., Parma, separate contracts. L. Skolnik, 3652 E. 147 St., archt. CD 10/4—ENR 10/11.

Que., Waterville—La Cong. des Religioux de Sainte Croix, 46 Surrey Gardens, Westmount, orphanage addn., to Tremblay & Bonin, 80-9 Ave., Sherbrooke. **$175,000.**

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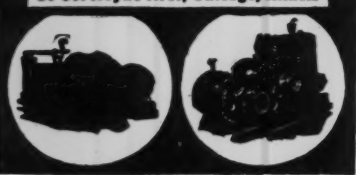

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COMMERCIAL BLDGS. (Contracts Awarded) (Cont'd.)

Pa., Garrett Hill—T. B. Young, Old Oaks Rosemont, residential development, separate contracts. **$300,000.** K. F. Otto, 6910 Market St., Upper Darby, archt.

Pa., Glenolden—Bell Telephone Co. of Penna., 1835 Arch St., Phila., Ridley Park Sharon Hill Telephone Exchange, to John N. Gill Co., Inc., 1700 Sansom St., Phila. **$250,000** or more. Awarded 12/10. G. W. Pepper, Jr., 1600 Walnut St., Phila., archt. CD 10/31—ENR 11/8.

Pa., Media—Bell Telephone Co. of Penna., 1835 Arch St., Phila., telephone exchange to E. H. Keefer & Son, 1321 Rodman St., Phila. **$150,000.** Zantzinger & Borie, 1531 Locust St., Phila., archts. Awarded 12/10.

★ **Pa., Morrisville**—Penn Valley Constructors, Inc., 20 N. Penna Ave., residential development, separate contracts. **$1,000,000.** CD 3/14—ENR 3/22.

Pa., Phila.—W. Brucker, 3402 Richmond St., residential development, separate contracts. **$150,000.**

Pa., Phila.—Fox Bros., 6518 N. Park Ave., residential development, Chew and Wister Sts. and at Comac St. and 65 Ave., separate contracts. **$300,000.**

★ **Pa., Phila.**—L. Isard, 6161 N. 16 St., 450 home residential development, separate contracts. **$4,000,000.**

Pa., Phila.—L. Isard, 6161 N. 16 St., residential development, Unruh St., separate contracts. **$175,000.** G. H. Murphy, 4412 Frankford Ave., archt.

Pa., Phila.—M. Gussman, 5701 Drexel Rd., residential development, to J. W. Siegrist, 211 W. Baltimore Ave., Lansdowne, archt.

Pa., Phila.—Montague Homes, Inc., 1325 Walnut St., residential development, separate contracts. **$285,000.** J. Ethan Fieldstein, 1325 Walnut St., archt.

★ **S. D., Yankton**—Sisters of St. Benedict, Yankton, nurses' home, academy and church, to W. A. Klinger Co., Inc., 201 Warnock Bldg., Sioux City, Ia. Est. **$1,200,000.**

Tex., Fort Worth—Elbert Gunn Constr. Co., 1732 Hurley St., thirty-six 1 story, brick housing units, Hilltop Rd. Owner builds **$180,000.** Texas Architects-Engineers, 701 Dees Bldg., archts.

INDUSTRIAL BUILDINGS

BIDS ASKED

Bids Asked January 2

O., Bedford—SALES, etc.—Sanford Motors, Inc., 707 Broadway, 1 story, 70x200 ft., brick service and sales bldg. $50,000. Ward & Conrad, Swetland Bldg., Cleveland, archts.

Bids Asked After January 5

★ **Tex., Houston**—PLANT, etc.—Carnation Co., 3003 D'Amico St., monolithic concrete type milk plant, $500,000; office, $250,000. Plans deposit $25. Finger & Rustay, 711 National Standard Bldg., archts. CD 9/27—ENR 10/11.

Bids Asked January 11

Ont., London—FACTORY—Hay & Co. Ltd., Norwich Ave., 1 story, 80x400 ft., steel factory 1 story, T shaped, 240x500 ft., hollow tile, steel sash, factory. $150,000. S. K. Sinclair, 284 Dundas St., archt.

Bids Asked

Pa., Ivy Rock (P.O. Conshohocken)—GARAGE, etc.—Alan Wood Steel Co., Ivy Rock, garage and repair shop. Approx. $40,000.

Pa., Phila.—AUTO SHOWROOM, etc.—L. D. T. Corp., 2211 N. 15 St., (selected list bidders), auto showroom and service bldg., alterations. $45,000. G. W. Neff, 15 and Locust Sts., archt.

Ont., Niagara Falls—PLANT—Borden Co. Ltd., 1195 Magdalen St., 60 x 130 ft., concrete, concrete block tile plant addn. $45,000. N. Mann, 1995 Franklin Ave., archt.

SOON LETS CONTRACT

★ **Ind., Crawfordsville**—PRINTING PLANT—R. R. Donelly & Son, 350 E. Cermak Rd. Chicago, Ill., soon lets contract 4 story, 150x560 ft. and 150x300 ft. brick, steel, concrete printing plant addn. $500,000. E. L. Clark, 75 E. Wacker Dr., Chicago, Ill., archt. CD 10/11—ENR 10/18.

★ **Ia., Des Moines**—SALES and SERVICE—Ford Motor Co., Dearborn, Mich., soon lets contract 1 story, brick, concrete, steel sales and service bldg. $700,000. Giffels & Vallet, Marquette Bldg., Detroit, archts. CD 9/27—ENR 10/4.

N. J., Camden — LABORATORY — The Ballinger Co., archt., 105 S. 12 St., Phila., Pa., soon lets contract Super Power Development Laboratory Bldg., 58, for R.C.A. Victor Corp., Front and Cooper Sts. $50,000 or more.

Pa., Phila.—FACTORY—Penn Novelty & Embroidery Co., 2613 W. York St., soon lets contract factory addn. $40,000. M. T. Glass, 224 E. Roosevelt Blvd., archt.

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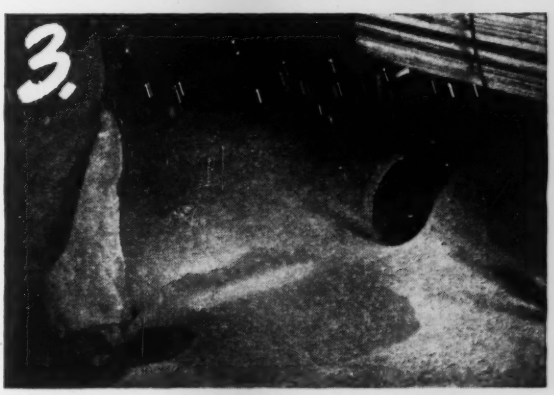

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INDUSTRIAL BLDGS. 'Soon Lets Contract. Cont'd.)

Pa., Sellersville—MILL—Samalto Hosiery Mills, 303 S. 4 St., Perkasie, soon lets contract hosiery mill. $50,000 or more. C. Talley, 314 W. Broad St., Telford, archt.
Bids Asked December 29

O., Cleveland—BAKERY, etc.—Michaud's Bakery, 9628 Lorain Ave., soon lets contract 1 story, bsmnt., 80x110 ft., brick bakery and restaurant. $40,000. Ward & Conrad, Swetland Bldg., archts. CD 11/14—ENR 11/22.

Tex., Lubbock—FACTORY, etc.—Lubbock Bag Co., Lubbock, soon lets contract 1 story, 147x230 ft., brick, hollow tile, rein.-con. factory and warehouse. Haynes & Strange, Myrick Bldg., superv. archts.

LOW BIDDERS

La., DeRidder — GARAGE — DeRidder Motor Co., DeRidder, garage, on U. S. Hy. 171, from Gravier & Harper, Alexandria. $65,972. CD 12/6—ENR 12/13.

Tex., Weslaco—WAREHOUSE—Mid-Valley Bonded Warehouse, c/o Central Power & Light Co., 309 Texas St., Weslaco, project abandoned, warehouse. $40,000. CD 4/11—ENR 4/19.

★ **Tex., Yoakum**—PLANT—Sterling Oil & Refining Co., Sterling Bldg., Houston, project abandoned, recyling plant. $2,500,000. CD 4/18—ENR 4/26.

CONTRACTS AWARDED

Calif., Los Angeles—PLANT—Paramount Pictures, Inc., 5451 Marathon St., 1 story, 99x207 ft., corrugated iron light mfg. bldg. to E. S. McKittrick Co., 7839 Santa Fe Ave., Huntington Park. About $160,000. Holms & Narver, 639 S. Spring St., engrs.

Calif., Pasadena—WAREHOUSE, etc.—Cornet 5-10-25c Store, 330 S. Fair Oaks Ave., 3 story, bsmnt., brick, concrete, warehouse and office, to W. C. Crowell Co., 170 E. California St. $325,600. Bids 12/5—CD 11/26—ENR 11/29.

Calif., San Francisco—STORAGE—General Brewing Co., 2601 Newhall St., 3 story, Class A, rein.-con. refrigerated storage bldg., to Cahill Bros., 206 Sansome St. Est. $170,000.

Ga., Atlanta—MOTION PICTURE STUDIO—C. Mion, 377 Techwood Dr., rein.-con., mosaic tile, brick motion picture studio, air conditioned leased to R. K. O. Pictures, to Mion Constr. Co., 377 Techwood Dr. N. W. Est. $300,000. Arthur Neal Robinson Sr., and Jr., Henry Grady Bldg., archts.

Ill., Chicago — FACTORY — Acme-Wiley Co., 3449 N. Kimball Ave. 1 story, 135x268 ft., brick factory, to Clearing Industrial Dist., 6445 S. Central St.***masonry, to O. Bergland, 8551 S. Bishop St.***plumbing, to George Hill Co., 6314 S. Central St. Est. $125,000. J. Cromlen, 6445 S. Central St., archt.

Ill., Chicago—FACTORY—Estee Bedding Co., 925 E. 93 St., 1 and 2 story, 195x283 ft., brick factory, to Robt. G. Regan Co., 228 N. LaSalle St.; plumbing to Economy Plumbing & Heating Co., 1308 S. Pulaski St. Est. $100,000. Frieastein Engrs. Co., 228 N. LaSalle St., engr.

Mich., Kalamazoo—FACTORY, etc.—Burroughs Mfg. Co., Kalamazoo, 120x250 ft. factory, and 75x70 ft. office, on N. Burdick St., to Miller-Davis Co., Kalamazoo. $150,000.

★ **Minn., Minneapolis** — WAREHOUSE — Madsen Constr. Co., 1790 Lyndale Ave. S., warehouse, 1869 E. 28 St. Owner builds. $600,000.

★ **Minn., Minneapolis**—PLANT—Sears Roebuck & Co., Lake St. and Elliot Ave., 1 story, rein.-con., brick mail order and distr. warehousing plant on 2 block site, bounded by Milwaukee Railroad right-of-way, Longfellow Ave., 27 and 28 Sts., to Madsen Const. Co., 1790 Lyndale Ave. S. $650,000. Magney-Tusler & Setter, 202 Foshay Tower, archts.

Minn., St. Paul—PLANT—Nash Coffee Co., A. E. Selby, mgr., 1330 Quincy St. N. E. general contract remodeling coffee roasting plant, 1745 University Ave., to A. Cederstrand Co., 966 Central Ave., Minneapolis. $10,900. C. W. Farnham, 7028 Oak Grove Blvd., Minneapolis, archt.

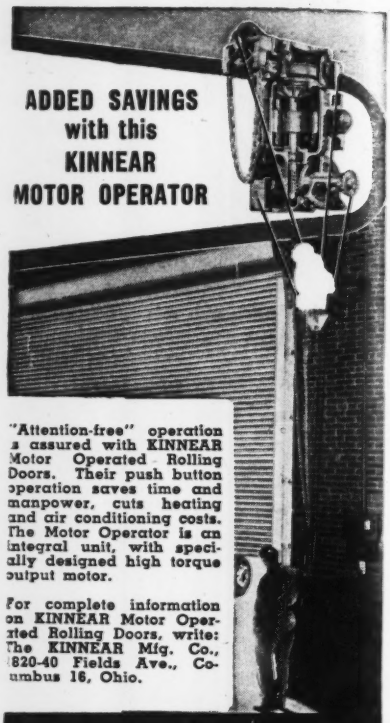
N. J., Bridgeton—WAREHOUSE, etc.—Owens Illinois Glass Co., Bridgeton, carton warehouse addn., to Hughes Foulkrod Co., 1505 Race St., Phila., Pa. $150,000. Awarded 12/14.

N. J., Camden—AUTO SALES, etc.—Haddon Motors, Inc., 1721 Haddon Ave., auto sales and service bldg. to Healy & Hancock, Inc., Kings Highway and Nevada Ave., Haddonfield. $70,000. Awarded 12 10. M. A. Bernhardt, 215 S. Broad St., Phila., Pa., archt.

N. J., Camden—PLANT—Miller Mfg. Co., 1100 N. 32 St., mfg. plant, to J. Mitchell, 206 Baird Ave., Mt. Ephraim. $40,000. W. T. Harker, 307 Market St., engr.-archt. Awarded 12/10.

N. J., Glassboro—FACTORY—Owens Illinois Glass Co., Box 1035 Toledo, O., altering and constructing factory and office bldg. addns., alterations, to Hughes Foulkrod Co., 1505 Race St., Phila., Pa. $75,000 or more. Awarded 12/14. Bellman Gillett & Richards, 518 Jefferson Ave., Toledo, O., engrs.-archts.

N. J., Kearny (br. Arlington)—PLANT—Western Electric Co., 100 Central Ave., design and construction altering mfg. bldgs., to United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa. Est. $150,000 or more. Awarded 12/15.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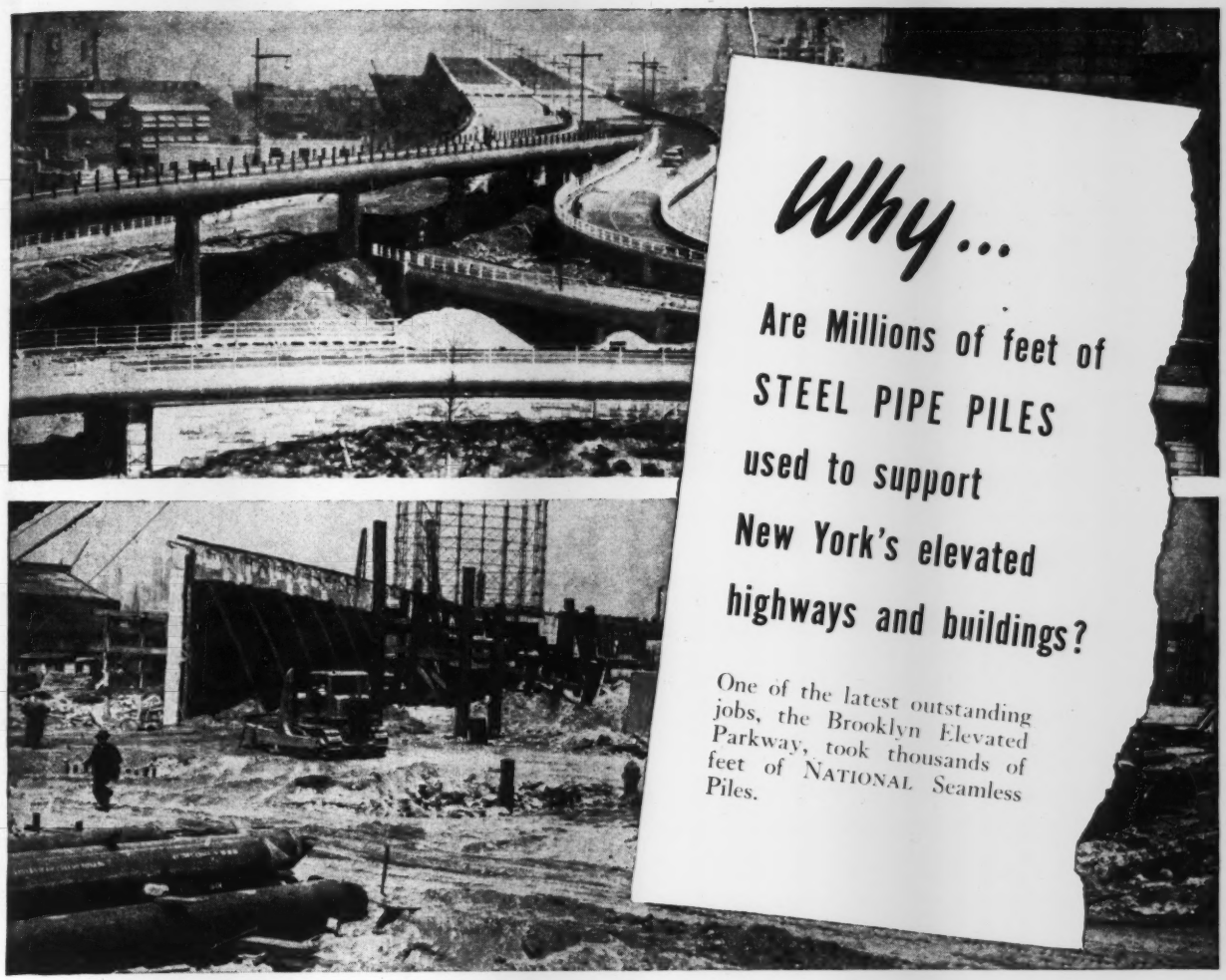

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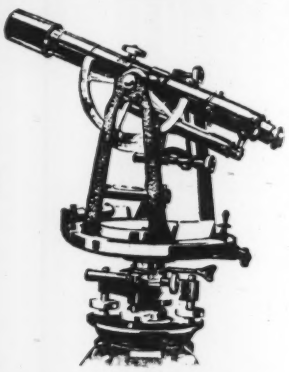

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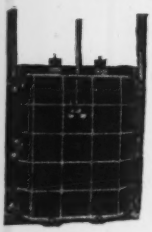

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INDUSTRIAL BLDGS. (Contracts Awarded, Cont'd.)

O., Cleveland — FABRICATING — Kilroy Structural Steel Co., 13800 Miles Ave., 1 story, 85x400 ft., steel, corrugated iron fabricating bldg., to Sam W. Emerson Co., 1836 Euclid Ave. G. S. Rider Co., Terminal Tower, engr.

O., Cleveland—PLANT—P. R. Hinkley, 9201 Detroit Ave., 1 story, 100x260 ft., brick electrical equip. plant, separate contracts. **$120,000.** S. W. Ferguson, 2362 Euclid Ave., engr. CD 10/15—ENR 10/18.

O., Cleveland — FACTORY—Oliver Corp., E. 193 St. and Euclid Ave., 1 story, 80x301 ft., brick, steel boxing and crating factory addn., to Sam W. Emerson, 1836 Euclid Ave. **$125,000.** CD 11/19—ENR 11/22.

O., Toledo—PLANT—Commercial Metals Treating, Inc., 1345 Miami St., plant addn., 1608 Tracy St., to Geo. W. Lathrop & Sons, Inc., 1501 Montclair St. Est. **$60,000.**

O., Toledo—PENTHOUSES—Willys-Overland Motors, Inc., Wolcott Bldg., frame, structural steel penthouses on roof of Building 56 for spray booths for painting automobiles, to H. J. Spieker Co., 1418 Elm St. Est. **$60,000.** Awarded 12/14.

Ore., Portland—GARAGE—Oregon Ltd., 1525 S. W. Alder St., tearing out 2 story sect. steel, brick, concrete bldg., constructing 2 car circular ramp to connect one 100x100 ft. 4 story, concrete structure for garage, to Ralph & Horwitz, 1835 N. Flint St., **$150,000.** Annand & Kennedy, Central Bldg., archts. Awarded 12/14.

Pa., Chester — FACTORY — South Chester Tube Co., Front and Thurlow Sts., factory alterations, to F. Massiah, 1342 Cypress St., Phila. **$40,000.** Awarded 12/14.

Pa., Downingtown—SERVICE, etc.—Susquehanna Pipe Line Co., 1608 Walnut St., Phila., service bldg., garage and machine storage shop, to J. Stopf, 3465 N. 5 St., Phila. **$40,000** or more. Awarded 12/14. G. W. Pepper, Jr., 1600 Walnut St., Phila., archt. CD 12/5—ENR 12/13.

Pa., Phila.—PLANT—William Gretz Brewing Co., 1536 Germantown Ave., bottling plant, to C. A. Kessler, Hardt Bldg., Broad St. and Columbia Ave. **$100,000.** A. H. Moore, 1649 N. Broad St., archt. Awarded 12/14.

Pa., Phila.—STORAGE—McCloskey Grant Corp., 20 St. and Indiana Ave., storage, separate contracts. Approx. **$40,000.**

Pa., Phila.—PLANT—Westbrook Publishing Co., 5800 N. Marvine St., printing plant addn., to F. B. Davis Sons, 240 N. 16 St. **$40,000.** Awarded 12/14.

Pa., Pittsburgh — PLANT—Federal Drug Co., 1014 Forbes St., remodeling, altering 8 story, 54x108 bldg., 947-949 Penn. Ave., to Edward Crump, Jr., Inc., 4031 Bigilow Blvd. Est. **$100,000.** J. E. Tillotson, Allison Park, archt.

Tex., Houston — PLANT — Rein Printing Co., 3401 Buffalo Dr., printing plant, to I. Fallis, 2603 Ruth St., approx. **$120,000.** H. D. Frankfurt, 2539 Southgate St., Houston, archts. CD 11/12—ENR 11/22.

Utah, Salt Lake City—SHOP—G. Baughman, 872 S. State St., plumbing and heating equip. shop, brick, steel, to Chytraus Constr. Co., 436 S. 4th West St. Est. **$50,000.** C. Scott, Dooly Bldg., archts.

Utah, Salt Lake City—GARAGE, etc.—Mountain Motor Co., R. C. Freed, mgr., 345 S. 2nd East St., garage and service bldg., to E. H. Dorland, 1877 Michigan Ave. **$75,000.** L. R. Snedaker, Utah Savings & Trust Bldg., archt.

Va., Narrows—PLANT—Celanese Corp. of America, 180 Madison Ave., New York, N. Y., plant, to George F. Hazelwood Co., Howard St., Cumberland, Md. **$45,000** or more. Bids 12/3, awarded 12/14. CD 11/13—ENR 11/15.

Va., Roanoke — WAREHOUSE—American Fruit Growers, Inc., Professional Arts Bldg., Hagerstown, Md., warehouse addn., alterations, own forces. **$50,000.** Office of E. P. Simon, 123 S. Broad St., Phila., Pa., archt.

Wis., Cedarburg—MACHINE SHOP—Electro Machines, Inc., Cedarburg, 1 story, 40x180 ft., concrete block, machine shop addn., concrete fdn., to R. Worth, 5000 N. Idlewild Ave., Milwaukee, Zone 11. Est. over **$40,000.** E. J. Echrang, 4411 N. Oakland Ave., Milwaukee, Zone 11, archt. CD 11/27—ENR 11/29.

Ont., Brantford — FACTORY — Slingsly Mfg. Co., Grand River Ave., factory, to Schultz Constr. Co., Ltd., 47 Albion St. **$56,000.**

Que., Longueuil—FACTORY—Scott Clothing Co., Ltd., 210 St. John St., clothing factory, to A. Dery, 241 Guilbeault Ave., **$55,000.** R. Fisher, 784 Wiseman Ave., Outremont, archt.

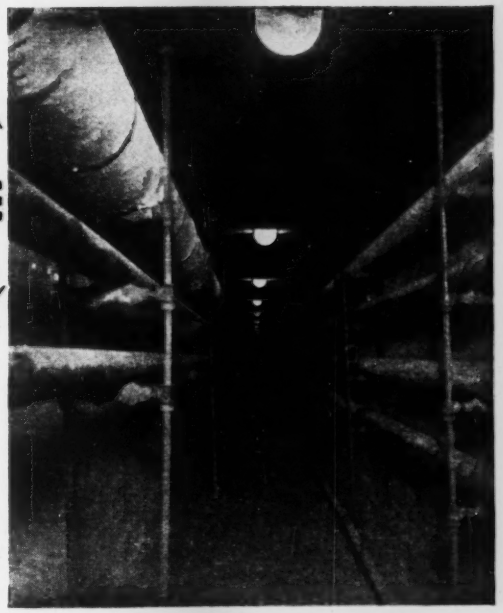
Que., Louiseville — PLANT — Air-Cell Insulation Products, Ltd., 144 Crescent St., Montreal, insulating board plant, to Page Equip. & Contg. Co., Ltd., 1497 Craig St., Three Rivers, **$57,850.**

Que., Montreal—FACTORY—Pine Avenue Constr. Co. Ltd., 130 W. Prince Arthur St., factory, to D. Kahansky, 3752 Kent St. Est. **$85,000.** M. M. Kolman, 4910 Victoria Ave., archt.

Que., Montreal—PLANT—Standard Barrels & Drums, Inc., 643 Farm St., plant, day labor, **$40,000.**

★**Que., Riviere Pentecote**—PLANT—Canadian International Paper Co. Ltd., Sim Life Bldg., Montreal, pulp wood plant, to W. Harney Reg'd., 105 Cote De La Montagne, Quebec City, about **$561,300.**

Solving CONCRETE Problems



Steam Tunnel constructed during Fall, 1944 for George M. Brewster & Son, Inc., Bogota, N. J. Architect: Voorhees, Walker, Foley and Smith, New York City; Contractor: Frank W. Bogert, Hackensack, N. J.

The Problem:— to construct a steam tunnel economically, water-tight against a ground water level at least 4 feet higher than the bottom of the tunnel.

The Solution:— Plastiment, the Sika Concrete Densifier, was used in all concrete in the proportion of one pound per bag of cement.

for cold weather concreting, various quantities of calcium chloride were added to accelerate hardening.

expansion joints, spaced about 50 feet apart across the tunnel were sealed with lead covered, V-shaped copper strips and caulked with Sika Igas Expansion Joint Compound.

As a result of proper design, supervision and workmanship, and the use of the proper Sika products, this structure is completely watertight. Waterproofing costs were held to less than 2c per square foot.

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Engineering Construction of All Types

NO PROJECT TOO LARGE—NONE TOO SMALL

155 East 44th Street New York 17, N. Y.

UNCLASSIFIED

BIDS ASKED

Bids Asked January 7

N. S., Halifax—WHARF—Dpt. Munitions & Supply, Ottawa, Ont., wharf repair, at H. M. C. Dockyard. About $35,000.

LOW BIDDERS

Iowa—RURAL POWER LINES—Butler Co. Rural Electric Co-operative, Allison, rejected bids Nov. 13, 65 mi. rural power lines, Butler Co. Stanley Eng. Co., Central State Bank Bldg., Muscatine, engr. CD 11/13—ENR 11/15.

Iowa—RURAL ELECTRIC LINES—Charlton Valley Electric Co-operative, Albia, 517 mi. rural electric lines, Monroe Co., from Miller Constr. Co., P. O. Box 209, Linton, Ind. **$489,009.** CD 9/5—ENR 9/13.

N. Y., North Beach—AIRFIELD BLDGS. —Comr. Marine & Aviation, Pier A, foot of Battery Pl., North River, New York, Zone 4, Dec. 17, Contr. 2474, general construction and installing equip. from Jonwal Constr. Co., 220 E. 42 St., New York, Zone 17, **$115,300**; heating and ventilating, from E. Kiss, 207 E. 43 St., New York, Zone 17, **$6,912**, at west wing addn. to Land Place Administration Bldg., LaGuardia Field. CD 12/11—ENR 12/18.

Pa., Pittsburgh — AIRPORT IMPROVEMENTS—Bd. Comrs. Allegheny Co., County Office Bldg., Dec. 11, water supply sys., for Greater Pittsburgh Airport, pump. station, Contr. 1, from Fleetwood, Maue & Gettys, 1551 W. Liberty Ave., **$16,000**; Contr. 3, electrical work, from Morganstern Electric Co., 241 1 Ave., **$1,395*****Contr. 4, water lines, from Samkay Builders, Inc., Law and Finance Bldg., **$64,378**; Contr. 5, drilling, from Pennsylvania Drilling Co., Chartlers Ave., **$5,950.** CD 11/27—ENR 11/29.

†Tex., Henderson—AIRPORT—Civil Aeronautics Admin., P.O. Box 1689, Fort Worth, Zone 1, Dec. 18, airport imprvs., Prop. No. 44-6-243, from Lank Engrg. & Constr. Co., Shreveport, La. **$171,058.** CD 12/5.

CONTRACTS AWARDED

Texas—RURAL POWER TRANSMISSION LINES—Panola-Harrison Electric Co-Operative, Marshall, 80 mi. rural electric power transmission lines, to Guthrie Electric Constr. Co., Longview, **$51,602.** Est. $75,000. CD 11/19—ENR 11/22.

Wyoming — PIPELINE — Comet Refining Co., c/o Dr. J. H. Miller, 1st National Bank Bldg., Denver, Colo., and D. R. Bumford, New Brighton, Minneapolis, Minn., 22½ mi. 16 in. crude oil pipeline between Hamilton oil fields and Thermopolis, to Pepper Tank & Constr. Co., c/o owner. Approx. $210,000. CD 12/13.

PROPOSED PROJECTS

Including class of projects previously listed as *postwar*.

PUBLIC BUILDINGS

PROPOSED WORK

Calif., Los Angeles—Los Angeles City Library Dpt., City Hall, imprv. Central Library, **$222,500.** Financing not provided.

★ **Calif., Napa** — Napa Co., Court House, plans by R. G. DeLappe, Clairemont Hotel, Berkeley, courthouse or addn. to present bldg. **$500,000.** CD 11/7.

Calif., Sacramento—City, City Hall, defeated **$180,000** bonds for 2 story, bsmnt. rein.-con. wing addn. to Crocker Art Gallery. CD 10/12—ENR 10/25.

Calif., Santa Rosa—City, City Hall, plans by Clarence Caulkins, Rosenberg Bldg., 75-bed rein.-con. hospital, **$350,000.** Bond election December 4. CD 9/20—ENR 9/27.

Calif., Sonora—Tuolumne Co., Court House, plans by W. Mooser, 251 Kearny St., San Francisco, courthouse addn. **$200,000.**

Conn., Willimantic—Town of Windham, Bd. Educ., Town Hall, plans completed by Chandler & Palmer, 16 Franklin St., Norwich, 4 story, 108x143 ft. brick, steel high school. **$275,000.** Financing provided. P. D. Bemis, 36 Pearl St., Hartford, engr.

★ **Fla., Jacksonville**—Duval Co. Welfare Bd., Jacksonville, imprv. expanding main hospital, **$84,800**; central service bldg., **$111,900**; internes home, **$63,600**; nurses and student nurses home, **$212,000**; psychiatric bldg., facilities, **$280,900**, all at Duval County Hospital. Financing provided. Reynolds, Smith & Hills, 10 S. Laura St., consult. engr.

★ **Ga., Gainesville**—Comrs., City and Hall Co., Gainesville, plans completed hospital and nurses home, **$1,000,000.** Financing provided.

Ia., Des Moines—City, plans by Dougher, Rich & Woodburn, Old Colony Bldg., remodeling city hall, **$162,000.** Financing not provided.

Ia., Mapleton—City, two 600 hp. generators at light plant, **$100,000.** Financing not provided. Buell & Winter, 508 Insurance Exchange Bldg., Sioux City, consult. engrs.

Ia., Ottumwa — Wapello Co., Ottumwa, plans by D. D. Morgan, Burlington, rebuilding hospital bldg. at Sunnyslope Sanatorium. **$300,000.** Financing provided.

Ia., Perry—Independent School Dist., plans by Brooks & Borg, Hubbell Bldg., high school addn., **$400,000.** Financing not provided.

La., Bossier City—City, H. Fuller, mayor, plans by S. G. Wiener & Associates, Commercial National Bank Bldg., Shreveport, fire station, **$45,000.**

★ **La., Natchitoches**—Northwestern State College, J. Farrar, pres., Natchitoches, 2 womens dormitories **$650,000**; 2 mens dormitories, **$475,000**; social science and commerce bldg., **$400,000**; school, **$150,000**; boiler and generator plant addns. **$125,000**; home economics bldg., **$250,000**; sewage disposal plant, **$125,000.**

★ **La., New Orleans**—City, Bd. Health, Dr. J. M. Whitney, supt., plans by Wm. Burk & Associates, Pan American Bldg., T. B. hospital, **$900,000.** CD 8/31/44—ENR 9/21/44, under Postwar Projects.

Me., Casco—Town, Supt. of schools, Town Hall, plans by Wm. O. Armitage, 23 Mitchell Rd., South Portland, consolidated school, **$150,000.** Financing not provided.

Me., Kennebunkport—Town, F. Higgins, chn. Comn., Town Hall, plans by Miller & Beal, 465 Congress St., Portland, consolidated school, **$150,000.** Financing not provided.

Me., Madawaska—Town, Town Hall, plans by Bunker & Savage, Augusta, high school. **$225,000.**

Me., Mechanic Falls—Town, Town Hall, plans by A. J. Harriman, Auburn, municipal bldg. and fire station. **$56,000.**

Me., Presque Isle—City, plans by Bunker & Savage, Augusta, school, Blake St. and Fort Fairfield Rd. **$276,200.**

★ **Mass., Boston**—City, City Hall, plans by James H. Ritchie & Assoc., 38 Newbury St., Boston, 500 bed hospital, **$3,655,000**; nurses home, **$887,000**, both on Harrison Ave. CD 1/21/44—ENR 2/10/44, under Postwar Projects.

Mass., Foxboro—Commonwealth of Mass., Dpt. Mental Health, 100 Nashua St., Boston, plans by Wm. G. Upham, 700 Washington St., Norwood, kitchen and dining facilities at State Hospital, **$396,250.** Financing provided.

Mass., Hyannis—Commonwealth of Mass., Dpt. Educ., 100 Nashua St., Boston, armory, drill hall and engineering laboratory at Maritime Academy, **$435,000.** CD 1/16—ENR 1/18.

Mass., Medford — City, W. Lawrence, mayor, City Hall, plans by Hutchins & French, 11 Beacon St., Boston, library, High and Hillside Sts. To exceed **$150,000.** Financing provided. CD 10/5—ENR 10/18.

Mass., Monson—Commonwealth of Mass., Dpt. Mental Health, 100 Nashua St., Boston, plans completed by J. Bilzerian, 9 Walnut St., kitchen and cafeteria addn., alterations Worcester State Hospital, Summer St. **$228,750.** Financing provided.

†Mich., Almont—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★ **†Mich., Ann Arbor**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$500,000. FWA.**

†Mich., Auburn Heights—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†Mich., Baldwin—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Bangor — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Base Line—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

★ **†Mich., Battle Creek**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$580,000. FWA.**

†Mich., Belleville—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†Mich., Bellevue—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★ **Mich., Benton Harbor**—Mercy Hospital, Benton Harbor, hospital wing, nursing school, laboratory and office bldgs. **$1,000,000.**

†Mich., Berrien Springs—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Bessemer—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$93,000. FWA.**

†Mich., Bloomfield Hills—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Breckenridge—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Bridgman—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Brighton—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Brooklyn—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Capac—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Carson City—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Cass City—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†Mich., Cassopolis—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†Mich., Cedar Springs—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Center Line—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†Mich., Charlevoix—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†Mich., Chesaning—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Clarkston—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Clawson—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Clio—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Coloma—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Colon—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

Mich., Concord—Concord Twp. School Dist. 1F, Concord, plans by C. C. Kressbach, Jackson, brick, steel, rein-con. school, **$310,500.** CD 10/4—ENR 10/18.

†Mich., Constantine—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Coopersville—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Corunna—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†Mich., Croswell—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Davison—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Dearborn—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, Monroe Blvd. Station, **$164,000. FWA.**

†Mich., Decatur—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

Mich., Detroit—Bd. Educ., 1354 Bway. Ave., plans by Giffels & Vallet & L. Rossetti, 1000 Marquette Bldg., brick, steel, rein.-con. school, Winship school site, **$165,000.**

★ **†Mich., Detroit**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., federal office bldg., **$3,920,000**; marine hospital, **$2,760,000**; post offices, 31 St. Station, **$235,000**; New Fairview Station, **$280,000**; North End Station, **$393,000**; Roosevelt Park Annex, **$3,000,000. FWA.**

†Mich., Dexter—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Drayton Plains—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Dundee—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Durand—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., East Jordan—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Eloise—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†Mich., Evart—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

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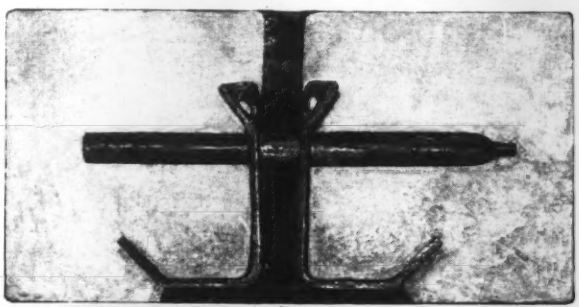

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★ Economical and easy to install.

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PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**Mich., Farmington**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Fennville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Flat Rock**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Flushing**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Fowlerville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Frankenmuth**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Galesburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**Mich., Garden City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,009. FWA.**

†**Mich., Gaylord**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Gladwin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Grand Blanc**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

★†**Mich., Grand Rapids** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, courthouse, **$500,000;** post office, courthouse, **$1,400,000. FWA.**

†**Mich., Grandville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Grosse Ile**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★**Mich., Hamtramck** — City, City Hall, plans by S. J. Stachowiak, 11838 **Joseph Campau Ave.,** brick, steel, concrete city hall, **$500,000.**

†**Mich., Harbor Beach**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Harbor Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Hartford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Holly**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Holt**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

Mich., Houghton—Michigan College of Mining & Technology, Houghton, men's dormitory addn. **$325,000.**

†**Mich., Hudsonville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Imlay City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Inkster**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

Mich., Ironwood—Gogebic Co., hospital addn. **$171,000.**

†**Mich., Ithaca** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Jonesville** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Keego Harbor**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Lake City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Lake Linden**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Lake Odessa**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Lake Orion** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Lakeview** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., L'Anse** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Lansing** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc., North Lansing Station, **$110,000. FWA.**

†**Mich., Lawton** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Leslie**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Mackinac Island**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Mancelona**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Manchester**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Marine City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Marlette**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Marysville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Mich., Michigan Center**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Milan**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$86,000. FWA.**

†**Mich., Milford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Millington**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Morenci**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Mount Clemens**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$240,000. FWA.**

†**Mich., Mount Morris**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Muskegon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. Muskegon Heights Branch. **$160,000. FWA.**

†**Mich., Nashville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Newaygo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., New Baltimore**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Newberry**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., New Buffalo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Northville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$91,000. FWA.**

†**Mich., Norway**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Onaway**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Ontonagon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Oscoda**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Otsego**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Ovid**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Oxford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Pigeon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Pinconning**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Plainwell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Portland**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Quincy**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Reed City**—Pub. Bldgs. Admin., 18 and F Sts. NW., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Richmond**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Romeo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Romulus**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Roscommon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Roseville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., St. Charles**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., St. Clair Shores**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., St. Ignace**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., St. Louis**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Saline**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Saugatuck**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Scottville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Sebewaing**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Shelby**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., South Lyon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Sparta**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Spring Lake**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Stambaugh**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Standish**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Stanton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Stevensville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Stockbridge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Tecumseh**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Three Oaks**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Trenton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Union City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Utica**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Van Dyke**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, **$95,000. FWA.**

†**Mich., Vassar**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Vicksburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Wakefield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Walled Lake**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Warren**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Watervliet**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Wayland**—Pub. Bldgs. Admin., 18 and F Sts N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., West Branch**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., White Cloud**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mich., Whitehall**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., White Pigeon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Williamston**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mich., Yale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Ada**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Aitkin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Minn., Appleton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

HOOK ROLLERS *On Top* OF THE TURNTABLE

KOEHRING 205

COMPLETELY ACCESSIBLE

NEW, developed especially for the small excavator, the load equalizing hook rollers of the Koehring 205 deliver every operating advantage of conventional hook roller design — free swings at peak loads, easy "coasting" on every swing. But, unlike conventional design, the rollers of the Koehring 205 are on top of the turntable, up where the operator can observe them from the cab, completely and easily accessible.

Because the hook roller track automatically adjusts, each of the three hook rollers takes only 1/3 of the load at any time; the full load never rides on only one. Rollers are lubricated from inside the operator's cab.

Located on top of the platform, not down under, the load equalizing hook roller assembly is completely accessible.

KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**Minn., Bagley**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Barnesville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Baudette**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Bayport**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Benson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Minn., Bird Island**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Blooming Prairie**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Blue Earth**—Pub. Bldgs. Admin., 18 and F. ts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Minn., Bovey**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Braham**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Buffalo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Canby**—Pub. Bldgs. Admin., 18 and F. Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Cannon Falls**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Cass Lake**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$235,000. FWA.**

†**Minn., Chaska**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, **$95,000. FWA.**

†**Minn., Chatfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Clarkfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Cokato**—Pub. Bldgs. Admin. 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Coleraine**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Crane Lake**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station, **$22,000. FWA.**

†**Minn., Crosby**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Dassel**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Dawson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Deer River**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Delano**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Elbow Lake**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Elk River**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Elmore**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Excelsior**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Fairfax**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Farmington**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Fertile**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Foley**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Forest Lake**—Pub. Bldgs. Admin. 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Fosston**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Fulda**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Gaylord**—Pub. Bldgs. Admin., 18 and F St. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Glenco** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Glenwood** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Granite Falls**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Hallock** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Hawley** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Hector** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Hinckley** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Jackson** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Jordan** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Kasson** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

Minn., Kennedy—Bd. Educ., J. E. Sundberg, c.k., plans by Lang & Raugland, 502 Wesley Temple Bldg., Minneapolis, rein.-con., brick, etc. school. **$150,000.**

†**Minn., Kenyon** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Lake Crystal**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Lakefield** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Lakeville** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Lamberton** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Le Center** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

Minn., Le Sueur—Bd. Educ., J. H. Block, clk., plans by E. D. Corwin, 813 Guardian Bldg., St. Paul, plans completed by E. D. Corwin, 813 Guardian Bldg., St. Paul, school addn., alterations. **$200,000** bonds voted. Financing provided. CD 11/12.

†**Minn., Le Sueur** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Luverne** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Minn., Madelia** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Madison** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Mahnomen**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

Minn., Meadowbrook—Village, Bd. Educ., R. B. Beal, chmn., bond election soon school addn. **$150,000.**

†**Minn., Melrose** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Milaca** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Minneapolis** — Federal Reserve Bank of Minneapolis, 5 St. and Marquette Ave., J. N. Peyton, pres., plans by Larson & McLaren, 1901 Foshay Tower, 4 story bank addn., alterations. Over **$150,000.**

★†**Minn., Minneapolis**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., federal office bldg., **$3,000,000;** post offices, Highland Station, **$125,000;** Lake St. Station, **$150,000;** St. Anthony Falls Station, **$90,000;** St. Louis Park Branch, **$105,000;** Traffic Station, **$210,000. FWA.**

†**Minn., Montgomery**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Moose Lake**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Mora** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Mound** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Mountain Lake** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Nashwauk**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., New Prague**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., New York Mills**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., North Branch**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash 25, D C, post office, etc. **$85,000. FWA.**

†**Minn, Olivia**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Onamia**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Ortonville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Osakis**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Osseo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn, Owatonna**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Minn., Paynesville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Pelican Rapids**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Perham**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Pine City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Pinecreek**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station, **$24,000. FWA.**

†**Minn., Pine River**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Plainview**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Preston**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Princeton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Red Lake Falls**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Redwood Falls**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$98,000. FWA.**

†**Minn., Renville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Robbinsdale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★**Minn., Rochester**—Bd. Educ., E. W. Cutschall, clk., plans by Ellerbe & Co., 1021 First Natl. Bank Bldg., St. Paul, high school, **$700,000.** CD 11/22/44—ENR 12/14/44, under Postwar Projects.

†**Minn., Roseau**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000;** border station, **$24,000. FWA.**

†**Minn., Rush City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Rushford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Saint Charles**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., St. Paul**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post offices, Industrial Station, **$175,000;** St. Clair Station, **$125,000. FWA.**

†**Minn., Sandstone**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Sauk Rapids**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Savage**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Sebeka**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Shakopee**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

Minn., Slayton—Bd. Educ., H. S. Holt, clk., plans by Pass & Rockey, Mankato, school, **$150,000** bonds voted. Financing provided. CD 4/12/44—ENR 4/20/44, under Postwar Projects.

†**Minn., Slayton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Sleepy Eye**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Springfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Staples**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Starbuck**—Pub. Bldgs. Admin., 18 and F St. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**Minn., Tracy**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Two Harbors**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$86,000. FWA.**

†**Minn., Tyler**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$86,000. FWA.**

†**Minn., Walker**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Warren**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Warroad**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Waterville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Wells**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Wheaton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Minn., Winnebago**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Winthrop**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Minn., Zumbrota**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Ackerman** — Pub. Bldgs Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Baldwyn** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Bay Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Biloxi** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, court house, custom house. **$460,000. FWA.**

†**Miss., Brandon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Bruce**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Calhoun City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Centreville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Clarksdale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, court house. **$465,000. FWA.**

†**Miss., Clinton**—Pub. Gldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Collins**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Como**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Decatur**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., De Kalb**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Drew**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Ellisville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Fayette**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Fulton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Gloster**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Greenville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$310,000. FWA.**

†**Miss., Herando**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Hollandale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Houlka**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Itta Bena**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Iuka**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Jackson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office and court house exten., etc. **$1,700,000. FWA.**

†**Miss., Lambert**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Laurel**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$365,000. FWA.**

★**Miss., Laurel**—Jones County, Laurel, 100-bed hospital and nurses home. **$600,000.**

†**Miss., Liberty**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Long Beach**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Lucedale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., McComb**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$165,000. FWA.**

†**Miss., Magee**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Marks**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Mendenhall**—Pub. Bldgs. Admin., 18 and F St. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Monticello**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc., **$95,000. FWA.**

†**Miss., Moorhead**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Morton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Moss Point**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Mount Olive**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$15,000. FWA.**

†**Miss., Natchez**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$220,000. FWA.**

†**Miss., Ocean Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Pass Christian**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Port Gibson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Prairie**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Prentiss**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Purvis**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Quitman**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., agriculture and post office, **$87,000. FWA.**

†**Miss., Raymond**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Richton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Rolling Fork**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Rosedale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Ruleville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Sardis**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Senatobia**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Shaw**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Shelby**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., State College**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Summit**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Sumrall**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Taylorsville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Tchula**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Tunica**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Tutwiler**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Union**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Utica**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Wesson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Miss., Wiggins**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Miss., Woodville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Albany**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Anderson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Appleton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Ava**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Belton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Bloomfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Bolivar**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Branson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Brunswick**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Buffalo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Cabool**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Camdenton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Campbell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Cape Girardeau**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, court house. **$535,000. FWA.**

†**Mo., Chaffee**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Concordia**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Crocker**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Crystal City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Cuba**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Dexter**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Dixon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Doniphan**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., East Prairie**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Edina**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Elsberry**—Pub. Bldgs. Admin., 18 and F Sts., N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Flat River**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Florissant**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Gallatin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Garden City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Gideon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Glasgow**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Grant City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Greenfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**Mo., Hamilton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Hayti**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Hermann**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Holden**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Houston**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Huntsville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Independence**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$390,000. FWA.**

†**Mo., Ironton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Joplin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, Station A. **$90,000. FWA.**

†**Mo., Kahoka**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

★†**Mo., Kansas City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., Federal Office Bldg. **$6,000,000;** garage, **$600,000;** post offices, Station B, **$110,000;** Station E, **$125,000. FWA.**

†**Mo., Lancaster**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Linn**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Malden**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Marshfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**Mo., Maysville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Memphis**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Milan**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Moberly**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$248,000. FWA.**

†**Mo., Monroe City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Montgomery City** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Mound City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Mountain View**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., New Madrid**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Odessa**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Osceola**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Owensville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Ozark**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Pacific**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Parkville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Piedmont**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Pierce City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Plattsburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D.C., post office, etc. **$95,000. FWA.**

†**Mo., Portageville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Potosi**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Princeton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Rich Hill**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Richland**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Robertson** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Rockport** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Saint Clair** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Saint James** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

Mo., St. Louis—City, c/o M. M. Kinsey, pres., Bd. Pub. Serv., 304 City Hall, Zone 1, brick, stone, rein.-con., public health center, Delmar Blvd. and Taylor Ave. **$287,000.** Financing provided. W. R. Crecelius, 302 City Hall, 12 and Market Sts., Zone 1, engr. CD 4/26/43—ENR 4/29/43, under Postwar Projects.

★†**Mo., St. Louis**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post offices, College Station, **$285,000;** Kirkwood Branch, **$145,000;** Merchants Station, **$150,000;** Richmond Heights Branch, **$132,000;** Webster Groves Branch, **$225,000. FWA.**

†**Mo., St. Louis** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., Marine Hospital remodeling. **$115,000. FWA.**

†**Mo., Salisbury** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Senath** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Seneca** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Shelbina** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Slater** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Stanberry** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Steele** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Steelville** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Sullivan** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Sweet Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Tarkio** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Thayer** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Troy** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Valley Park**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Versailles** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Warrenton** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Warsaw** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mo., Waynesville** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Mo., Wellsville** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mo., Willow Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mont., Baker**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mont., Bigtimber**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

★†**Mont., Billings**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, courthouse, **$740,000. FWA.**

†**Mont., Bozeman**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$380,000. FWA.**

†**Mont., Browning**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mont., Chester**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., agriculture post office, **$95,000. FWA.**

†**Mont., Chinook**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Choteau**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Columbus**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Conrad**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Cut Bank**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Mont., Del Bonita**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., Custom and immigration center, **$24,000. FWA.**

†**Mont., Forsyth**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mont., Fort Benton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Hamilton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., public health service laboratory, **$125,000. FWA.**

†**Mont., Hardin**—Pub. Bldgs. Admin., 18 and F Sts., N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Harlowton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Laurel**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Mont., Libby**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Livingston**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$50,000. FWA.**

†**Mont., Malta**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Morgan**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., custom and immigration center, **$104,000. FWA.**

†**Mont., Opheim**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., custom and immigration center, **$104,000. FWA.**

†**Mont., Plentywood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Mont., Polson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

† **Mont., Raymond**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., custom and immigration center, **$65,000. FWA.**

† **Mont., Red Lodge**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

† **Mont., Ronan**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

† **Mont., Roundup**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

† **Mont., Scobey**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000,** custom and immigration center, **$38,000. FWA.**

† **Mont., Shelby**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

† **Mont., Stevensville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

† **Mont., Sweetgrass**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., custom and immigration center. **$175,000. FWA.**

† **Mont., Turner**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., custom and immigration center. **$102,000. FWA.**

† **Mont., Westby**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., border station. **$24,000. FWA.**

† **Mont., Whitefish**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

† **Mont., Whitetail**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., custom and immigration center. **$105,000. FWA.**

† **Mont., Whitelash**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., border station. **$24,000. FWA.**

† **Mont., Wildhorse**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., custom and immigration center. **$104,000. FWA.**

† **Mont., Willow Creek**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., custom and immigration center. **$104,000. FWA.**

† **Mont., Wolf Point**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

† **Neb., Ainsworth**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

† **Neb., Alliance**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**Neb., Alma**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Ashland**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Atkinson**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Bassett**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Bayard**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Bellevue**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Benkelman**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Bloomfield**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Bridgeport**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Bruning**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Burwell**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Cambridge**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Chappell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Cozad**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Creighton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Franklin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Friend**—Pub. Bldgs., Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Fullerton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Gering**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Gordon**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Gothenburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Grant**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Hartington**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Harvard**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Humboldt**—Pub. Bldgs. Admin., 18 and F. Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Imperial**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Kearney**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Kimball**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Lincoln**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, University Place Station. **$100,000. FWA.**

†**Neb., Loup City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Lyons**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Madison**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Mitchell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Morrill**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Nebraska City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$185,000. FWA.**

†**Neb., Neligh** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Oakland**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★†**Neb., Omaha**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, court house, **$7,600,000**; garage, **$270,000**; Ames Avenue Station Post Office, **$140,000. FWA.**

†**Neb., Orleans**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, **$85,000. FWA.**

†**Neb., Oxford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Pender**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Pierce**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Plainview**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Ravenna** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Rushville** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., St. Paul** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., South Sioux City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Stanton** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Sutton** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Tekamah** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Weeping Water**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., West Point** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Neb., Wilber** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Wisner** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Neb., Wymore** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Nev., Callente** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Nev., Hawthorne** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**Nev., McGill** — Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Nev., Pioche** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★†**Nev., Reno** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$600,000. FWA.**

†**Nev., Sparks** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**Nev., Winnemucca**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$100,000. FWA.**

†**N. H., Ashland** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Bristol** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Charlestown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Colebrook** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Conway** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Durham**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$99,000. FWA.**

†**N. H., East Jaffrey**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Farmington**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Gorham** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Groveton** — Pub. Bldgs Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Hampton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. H., Hillsboro**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

N. H., Lisbon—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Nashua**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$310,000. FWA.**

†**N. H., New London**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Newmarket**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., North Conway**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Pittsfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Salem Depot**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Suncook**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Tilton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Walpole**—Pub. Bldgs. Admin., 18 and F Sts., N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., West Lebanon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Whitefield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. H., Wilton**—Pub. Bldgs. Admin., 18 and F Sts., N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Absecon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Allendale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Allenhurst**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Atco**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Atlantic Highlands**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Avenel**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Avon by the Sea**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Bay Head**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Beach Haven**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Belvidere**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**N. J., Berlin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Bernardsville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†**N. J., Beverly**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Blackwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Blairstown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Bloomingdale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Bradley Beach**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†**N. J., Branchville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★**N. J., Bridgeton**—Bd. Educ., Bridgeton, plans by Hacker & Hacker, 201 Main St., Fort Lee, high school alterations. **$757,969.**

†**N. J., Butler**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Camden**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, Collingswood Branch. **$125,000. FWA.**

†**N. J., Cape May C. H.**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Carlton Hill**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Carteret**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$100,000. FWA.**

†**N. J., Cedar Grove**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Chatham**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Clayton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**N. J., Clementon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Clinton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Closter**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Cranbury**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Delair**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Delanco**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Denville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Dumont**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Dunellen** — Pub. Bldgs. Admin., and F Sts. N.W., Wash. 25, D. C., post office, etc. **$170,000. FWA.**

†**N. J., East Paterson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Eatontown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Egg Harbor City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†**N. J., Elizabeth**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, Roselle Park Station. **$120,000. FWA.**

†**N. J., Elmer**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Englishtown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Fair Lawn**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$157,000. FWA.**

†**N. J., Fairview**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25 D. C., post office, etc. **$90,000. FWA.**

†**N. J., Fanwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Farmingdale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Florence**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Fords**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Franklin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Frenchtown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Garwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$102,000. FWA.**

†**N. J., Gibbstown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Glassboro**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Graselli**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Hackensack**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D.C., post office, etc. **$340,000. FWA.**

†**N. J., Hamilton Square**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Highbridge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Highland**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Hillsdale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Hohokus**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Hopewell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Iselin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Jamesburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★†**N. J., Jersey City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post offices, Bergen Station, **$270,000**; Hudson City Station, **$165,000**; garage, **$240,000. FWA.**

†**N. J., Keansburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Kenilworth**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Keyport**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**N. J., Lakehurst**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Lambertville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Laurel Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Lawrenceville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Little Ferry**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Little Silver**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Lodi**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Long Branch**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$210,000. FWA.**

†**N. J., Mahwah**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Manasquan**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Manville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**N. J., Maple Shade**—Pub. Bldg. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Mays Landing**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Medford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Midland Park**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Milford**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Milltown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Montclair**—Pub. Bldgs. Admin., 18 and F Cts. N.W., Wash. 25, D. C., post office, etc. **$375,000. FWA.**

†**N. J., Morris Plains**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Mountain Lakes**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Mountain View**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Mount Ephraim**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Netcong**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★†**N. J., Newark**—Pub. Bldgs. Admin., 18 and F Sts., N.W., Wash. 25, D. C., garage, **$390,000**; post offices, Belleville Branch, **$110,000**; Clinton Hill Station, **$275,000**; Roseville Station, **$180,000. FWA.**

N. J., New Brunswick—City, City Hall, Union Bus Terminal, Washington St. **$307,-274.** M. W. Taylor, City Hall, city engr.

†**N. J., Newfield**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Newton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$134,000. FWA.**

†**N. J., Nixon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Ocean Grove**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Oradell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Palisade**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Palisades Park**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Palmyra**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Park Ridge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Parlin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Pemberton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Pennington**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Point Pleasant**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Ramsey**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Raritan**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Ridgefield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**N. J., Ringwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., River Edge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Rochelle Park**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Rockaway**—Pub. Bldgs. Admin., 18 and F. Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Roebling**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Runnemede**—Pub. Bldgs., Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., Sayreville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Scotch Plains**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Sea Bright**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Sea Girt**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Seaside Heights**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Sewell**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., South Amboy**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., South Bound Brook**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. J., South Orange**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, Maplewood Branch. **$190,000. FWA.**

†**N. J., South Plainfield**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Sparta**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Springfield**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Spring Lake**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. J., Stone Harbor**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Sussex**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Swedesboro**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Teaneck**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$190,000. FWA.**

†**N. J., Tenafly**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†**N. J., Union**—Pub. Bldgs. Admin., 18 and F. Sts. N. W., Wash. 25, D. C., post office, etc. **$190,000. FWA.**

†**N. J., Vauxhall**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc **$90,000. FWA.**

†**N. J., Waldwick**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

★**N. J., Wayne Twp.**—Bd. Educ., Wayne Twp., plans by Hacker & Hacker, 201 Main St., Fort Lee, high school addns., alterations. **$501,500.**

†**N. J., West Trenton**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Westville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Wharton**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**N. J., Whippany**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Williamstown**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Woodbine**—Pub. Bldgs. Admin. 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Woodbridge**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$125,000. FWA.**

†**N. J., Woodstown**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Wrightstown**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. J., Wyckoff**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

★†**N. M., Albuquerque**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$2,600,000. FWA.**

†**N. M., Antelope Wells**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., border station, **$24,000. FWA.**

†**N. M., Artesia**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Belen**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. M., Carlsbad**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$310,000. FWA.**

†**N. M., Clayton**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Columbus**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., border station, **$24,000. FWA.**

†**N. M., Espanola**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Farmington**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Fort Stanton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., Marine Hospital. **$110,000. FWA.**

†**N. M., Fort Sumner**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**N. M., Hobbs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$190,000. FWA.**

†**N. M., Hurley**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., **$95,000. FWA.**

†**N. M., Lordsburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Lovington**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Mountainair**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Old Albuquerque**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

★†**N. M., Boswell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, court house, **$640,000. FWA.**

★†**N. M., Santa Fe**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$550,000. FWA.**

†**N. M., Santa Rosa**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Socorro**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc., **$95,000. FWA.**

†**N. M., Springer**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. M., Taos**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. M., Tucumcari**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, post office, etc. **$120,000. FWA.**

†**N. Y., Adams**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Alden**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA**

†**N. Y., Alexandria Bay**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†**N. Y., Alfred**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Allegany**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Altamont**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Amenia**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Amityville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$125,000. FWA.**

†**N. Y., Arcade**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Ardsley**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. Y., Athens**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Au Sable Forks**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Avon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C. post office, etc. **$85,000. FWA.**

†**N. Y., Babylon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$162,000. FWA.**

†**N. Y., Bainbridge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Baldwin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$155,000. FWA.**

†**N. Y., Bedford Hills**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Bellmore**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Bellport**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. Y., Belmont**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Bethpage**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Bolivar**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Brentwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Brewster**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$125,000. FWA.**

†**N. Y., Briarcliff Manor**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Bridgehampton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. Y., Brightwaters**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. Y., Broadalbin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Brocton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★†**N. Y., Buffalo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, Federal Office Building, garage, **$8,250,000;** Marine Hospital **$2,500,000;** immigration station, **$210,000;** post offices, Kenmore Branch, **$177,000;** Lackawanna Branch, **$115,000;** Williamsville Branch, **$170,000. FWA.**

†**N. Y., Caledonia**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Callicoon**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cambridge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Camden**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Camillus**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Canisteo**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cannon's Corner**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$24,000. FWA.**

†**N. Y., Carmel**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Castleton on Hudson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cattaraugus**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cazenovia**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cedarhurst**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$140,000. FWA.**

†**N. Y., Center Moriches**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Central Islip**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Central Valley**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. Y., Champlain**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$150,000. FWA.**

†**N. Y., Chappaqua**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Chatham** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Chatauqua**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Chester** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. Y., Churubusco**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$22,000. FWA.**

†**N. Y., Clayton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$120,000. FWA.**

†**N. Y., Clifton Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Clinton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Cold Springs**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Corinth**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cornwell**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cornwall on the Hudson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Coxsackie**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Croton on the Hudson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Cuba** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Dannemora**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$82,000. FWA.**

†**N. Y., Deferiet** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**Y. Y., Deposit** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Earlville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., East Aurora**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†**N. Y., East Hampton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$125,000. FWA.**

†**N. Y., East Islip**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., East Northport**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., East Rockaway**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., East Syracuse**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**N. Y., East Williston**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Ebenezer**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Eden**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Elizabethtown**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Elmira**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, Elmira Heights Branch. **$80,000. FWA.**

†**N. Y., Elmsford**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†**N. Y., Endwell**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Falconer**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Farmingdale**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$190,000. FWA.**

†**N. Y., Fayetteville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†N. Y., **Ferndale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Fleischmanns**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★†N. Y. **Flushing**—Pub. Bldgs. Admin., 18 and F Sts., N. W., Wash. 25, D. C., post offices, Bayside Station, **$175,000;** Corona Station, **$240,000;** Little Neck Station, **$120,000;** Woodside Station, **$375,000. FWA.**

†N. Y., **Fonda**—Pub. Bldgs. Admin., 18 and F. Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Franklin Square**—Pub. Bldgs. Admin., 18 and F. Sts. N. W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†N. Y., **Franklinville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Friendship**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post Office, etc. **$85,000. FWA.**

†N. Y., **Garrison**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Gasport**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Geneseo**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†N. Y., **Glen Head**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Greene**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Greenport**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Greenwich**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Groton**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Hammondsport** — Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Hampton Bays** — Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Hancock**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Hartsdale**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†N. Y., **Hawthorne**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Hewlett**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†N. Y., **Hicksville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$120,000. FWA.**

†N. Y., **Highland**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$110,000. FWA.**

†N. Y., **Highland Falls** — Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Hilton**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Holley**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Huntington**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Irvington**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†N. Y., **Islip** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Jamaica**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post offices, Hollis Branch **$135,000;** Richmond Hill Branch, **$250,000. FWA.**

★†N. Y., **Jamestown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, court house. **$865,000. FWA.**

†N. Y., **Jamieson's Line** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$24,000. FWA.**

†N. Y., **Katonah**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Keeseville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Kings Park**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Lacona**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Lake Ronkonkoma**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†N. Y., **Lawrence**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Lewiston** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Lindenhurst**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. $95,000. **FWA.**

†N. Y., **Liverpool**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Livingston Manor** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Locust Valley**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. $85,000. **FWA.**

†N. Y., **Long Island City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, Steinway Ave. Sta. **$230,000. FWA.**

†N. Y., **Loudonville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office. etc. **$85,000. FWA.**

†N. Y., **Lynbrook**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$186,000. FWA.**

†N. Y., **Mahopac** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Malverne**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. $95,000. **FWA.**

†N. Y., **Manhasset** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$186,000. FWA.**

†N. Y., **Manlius**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Marcellus**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Margaretville**—Pub. Bldgs Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. $85,000. **FWA.**

†N. Y., **Marlboro**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Maryknoll**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†N. Y., **Massapequa**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. $95,000. **FWA.**

†N. Y., **Mattituck**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office. etc. **$85,000. FWA.**

†N. Y., **Mayville** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Merrick**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Mexico**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office. etc. **$85,000. FWA.**

†N. Y., **Middletown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$275,000. FWA.**

†N. Y., **Millbrook**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Millerton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†N. Y., **Minetto**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Mohawk**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Monroe**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Montgomery**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office etc. **$85,000. FWA.**

†N. Y., **Montour Falls**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$92,000. FWA.**

†N. Y., **Mount Morris**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Nanuet**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Naples**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Narrowsburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **New Berlin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **New City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Newfane**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **New Hartford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

N. Y., **New Hyde Park**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†N. Y., **New Paltz**—Public Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$92,000. FWA.**

†N. Y., **New York Mills**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Niagara University** — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **North Cohocton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **North Collins**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **North Syracuse**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Northville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Norwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Nunda**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Oakfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Old Forge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. $85,000. **FWA.**

†N. Y., **Oneonta**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$200,000. FWA.**

†N. Y., **Orangeburg**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$105,000. FWA.**

†N. Y., **Palmyra**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$125,000. FWA.**

†N. Y., **Parksville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Pawling**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Perry**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$100,000. FWA.**

†N. Y., **Perry's Mill**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station, **$22,000. FWA.**

†N. Y., **Phelps**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Philmont**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Phoenix**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Pine Plains**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Pittsford**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Pleasantville**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$190,000. FWA.**

†N. Y., **Point Pleasant**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Port Henry**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Port Jefferson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Port Jefferson Station**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†N. Y., **Pulaski**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Randolph**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Ravena**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Red Hook**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★N. Y., **Rochester**—University of Rochester School of Medicine & Dentistry, plans by Wm. G. Kaelber & L. W. Waasdorp, 311 Alexander St., 5 story, structural steel, reinforced con., brick neuro-psychiatric clinic. **$600,000.**

†N. Y., **Roosevelt**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†N. Y., **Roscoe**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Roslyn**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†N. Y., **Roslyn Heights**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

PUBLIC BLDGS. (Proposed Work, Cont'd.)

†**N. Y., Rouses Point**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Sag Harbor**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Saint James**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Sayville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Schoharie**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Schuylerville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Sea Cliff**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Seaford**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Sherburne**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Sherrill**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Shortsville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Sidney**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$115,000. FWA.**

†**N. Y., Skaneateles**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Smithtown Branch**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Sodus**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Southampton**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$175,000. FWA.**

†**N. Y., South Fallsburg**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Southold**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Spencerport**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Stamford**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Stony Brook**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$90,000. FWA.**

†**N. Y., Swan Lake**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Syosset**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Tannersville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Tarrytown**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$243,000. FWA.**

†**N. Y., Trumansburg**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Tupper Lake**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$98,000. FWA.**

†**N. Y., Tuxedo Park**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Unadilla**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Valatie**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Valhalla**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Valley Stream**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$165,000. FWA.**

†**N. Y., Vestal**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Wallkill**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Wantagh**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Warrensburg**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Warwick**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., Waterville**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Watervliet**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$107,000. FWA.**

†**N. Y., Wayland**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Webster**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Weedsport**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Westbury**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$125,000. FWA.**

†**N. Y., Westfield**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. Y., West New Brighton (Sta. Staten Island)**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Westport**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Whitesboro**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Williamson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Wingdale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Wolcott**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Woodbourne**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Woodmere**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$125,000. FWA.**

†**N. Y., Woodridge**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Woodstock**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. Y., Yonkers**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, Tuckahoe Branch. **$210,000. FWA.**

†**N. Y., Youngstown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

★**N. C., Burlington**—Bd. Comrs. Alamance Co., C. M. Williams, chn., Burlington. **$500,000** bond election Dec. 4, county hospital.

N. C., Wilson—Wilson Co. and Town of Wilson, Wilson, c/o Dr. C. A. Woodard, chn. Medical group, W. H. Blalock, chn. Bldg. Comrs., county-town hospital, **$250,000.**

†**N. D., Antler**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$24,000. FWA.**

†**N. D., Beach**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Beulah**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Bottineau**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Bowman**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Cando**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Carbury**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$22,000. FWA.**

†**N. D., Casselton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Cavalier**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Cooperstown**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Crosby**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000**; border station **$24,000. FWA.**

†**N. D., Dunseith**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$90,000. FWA.**

†**N. D., Ellendale**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Enderlin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Fessenden**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Fortuna**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$24,000. FWA.**

†**N. D., Garrison**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Glen Ullin**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Hankinson**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Hannah**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$24,000. FWA.**

†**N. D., Hansboro**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., border station. **$24,000. FWA.**

†**N. D., Harvey**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Hazen**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Hebron**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Hillsboro**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Kenmare**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., La Moure**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

†**N. D., Lidgerwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$85,000. FWA.**

†**N. D., Linton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office, etc. **$95,000. FWA.**

O., Bexley—City, Wm. Schneider, mayor, plans completed by T. E. Brand, 58 S. Remington Rd., Columbus, 1 and 2 story municipal bldg. and garage. **$200,000.** Financing provided. Land rights not cleared, legal obstacles to be overcome.

★**O., Canton**—Comrs. Stark Co., Canton, plans by H. C. Frank, C. E. Firestone & L. J. Motter, Canton, courthouse. **$3,000,000.** Financing not provided.

O., Carrollton—Carrollton Exempted School Dist., Carrollton, 2 story, bsmnt., recreational bldg., adjacent to high school. **$200,000.** Financing not provided.

★**O., Cleveland**—City, City Hall, plans by Garfield, Harris, Robinson & Schaefer, National City Bank Bldg., prison farm. **$1,000,000.**

O., Cleveland—City, City Hall, plans by Ward & Conrad, Swetland Bldg., health center, E. 55 St. and Superior Ave. **$200,000.** CD 8/25/44—ENR 9/7/44, under Postwar Projects.

O., Franklin Furnace—Green Twp. Local School Dist., high school addn. **$188,000.**

★**O., Hamilton**—City, C. N. Teaff, dir. P. Wks., City Hall, imprv. electric plant incl. installation steam generating unit, **$503,300**; expan. present electric substations on N. Third St. and Maple Ave., new substations in Lindenwald and East Hamilton, also expan. distr. sys. **$314,360.** A. A. Smalley, Municipal Bldg., city engr. CD 10/5—ENR 10/18.

★**O., Hamilton**—City and Butler Co., approved bonds, school, Fairfield Twp., **$225,000**; school, Lemon Twp., **$318,000.** CD 10/23—ENR 11/15.

O., Newton Falls—Village, Village Hall, combined city hall, police and fire station. **$150,000.** Charles G. Kistler, Kent, archt.

★**O., Springfield**—City, Municipal Bldg., approved bonds schools. **$3,582,000.** Financing provided.

O., Youngstown—Austintown School Dist., J. S. Fitch, pres., 4538 Mahoning Ave., school. **$182,000.**

Okla., Barnsdall—City, W. R. Foster, mayor, City Hall, power and light plant. **$205,000.** E. T. Archer & Co., 114 W. 10 St., Kansas City 6, Mo., consult. engrs.

★**Okla., Norman**—Bd. Regents University of Oklahoma, Norman, dining hall and recreation bldgs. **$862,672.**

Okla., Okmulgee—City, City Hall, municipal bldg. and auditorium. **$250,000.** Financing not provided. T. J. Embree, City Hall, engr. CD 10/11—ENR 11/15.

★**Okla., Tulsa**—Bd. Educ., City Hall, **$4,500,000** bond election Dec. 4, schools.

Pa., DuBois—DuBois Public Library, A. F. Osmond, pres., Pershing Apts., DuBois, 1 or 2 story, bsmnt., brick library. **$150,000.**

Pa., Erie—Bd. Ed. Millcreek Twp., B. A. Goodrich, principal, plans by W. T. Monahan, 406 Marine Bank Bldg., 2 story, brick high school. **$200,000.** Financing not provided.

Pa., Hilltown Twp. (Blooming Glen P.O.)—Hilltown School Bd., J. M. Grasse, superv. principal, plans by L. P. MacKenzie, 112 S. 16 St., Phila., consolidated school. **$200,000.** Bonds voted. Financing provided. CD 10/3—ENR 10/18.

Pa., Hollidaysburg—Blair Co., courthouse addn. **$240,000.**

★**Pa., Mayview**—Commonwealth of Pennsylvania, Dpt. Property & Supplies, Bureau Constr., Harrisburg, State Hospital addns., alterations. **$804,000.** Financing provided. A. J. Warlow, Harrisburg, ch. engr.

PUBLIC BLDGS. (Proposed Work, Cont'd.)

Pa., Mount Lebanon—Bd. Educ., Mount Lebanon Twp., Dr. H. V. Herlinger, supt., 735 Washington Rd., plans by Ingham & Boyd, 1211 Empire Bldg., Pittsburgh, 2 story, part bsmnt., brick, steel school, Moffat St., off Bower Hill Rd. **$150,000.** Financing not provided.

Pa., New Kensington—Bd. Educ., E. T. Chapman, supt., High School Bldg., plans by E. Cooke, 316 Charles St. 2 story, brick vocational school. **$400,000.** Financing not provided.

Pa., Smith Twp.—Bd. Educ., Smith Twp. H. L. Tennyson, supervy. principal, 72 highland Ave., Burgettstown, plans completed by A. Tennyson, 275 Baywood Ave., Pittsburgh, Zone 16, 1 story, part bsmnt., 60x220 ft., brick, steel consolidated grade school, **$150,000.** Financing not provided.

Pa., Washington—Commonwealth of Pennsylvania, Dpt. Prop. & Supplies, Harrisburg, plans by Lawrie & Green, 321 N. Front St., Harrisburg, and G. Dickson, assoc. archt., 22 N. Main St., state police barracks. **$150,000.** CD 9/27—ENR 10/11.

Pa., Woodville—Commonwealth of Pennsylvania, Dpt. Property & Supplies, Harrisburg, State Hospital addns., alterations. **$455,000.** Financing provided. **A. J. Warlow,** Harrisburg, ch. engr. CD 10/25—ENR 11/15.

★**†S. C., Beaufort**—Yards & Docks Annex, Navy Dpt., Arlington, Va., plans by F. P. Cret, 1518 Walnut St., Phila., Pa., and J. N. Pease & Co., Johnson Bldg., Charlotte, N. C., hospital. NOY 12213. **$5,000,000.**

S. C., Edgefield—Edgefield Co., hospital addns. **$208,154.**

★**Tex., Dallas**—Dallas Co., c/o Judge, Court House, courthouse, **$1,750,000.** Financing not provided. CD 9/30/43—ENR 10/7/43.

†Tex., Fort Sam Houston—U. S. Eng., Fort Sam Houston, 1 story, concrete and masonry bakery. Ser. No. 45-154-46-50.

Tex., Port Neches—Port Neches Independent School Dist., Port Neches, plans 5% completed by H. Voelcker, 2801 San Jacinto St., Houston, and W. B. Livesay, San Jacinto Life Bldg., Beaumont, Senior High School, **$300,000;** Junior High School, **$250,000;** woodworking and mechanical shop, **$60,000.** Financing not provided.

★**Tex., San Antonio**—Comrs. Bexar Co. Court House and San Antonio Junior College Ind. School Dist., Matagorda and Lavaca Sts., voted bonds Junior College **$940,000;** heating plant and tunnels, **$60,000.** Phelps & DeWees & Simmons, 15151 Majestic Bldg., archts. CD 10/10.

★**Tex., San Antonio**—Bd. Educ., Matagorda and Lavaca Sts., voted bonds rehabilitation 2 story, brick concrete Main Ave. Tech. School, **$200,000;** 2 story, brick Lanier School, **$200,000;** 21 brick, concrete schools, **$675,750;** 6 brick, concrete Senior Schools, **$486,000;** 8 brick, concrete Junior Schools, **$495,750.** Phelps & DeWees & Simmons, 1515 Majestic Bldg., San Antonio, archts. CD 10/5—ENR 10/18.

Vt., Newport—City, City Hall, plans by J. A. Britton, 20 Federal St., Greenfield, Mass., Veterans Memorial Hospital. **$135,000.**

Va., Charlottesville—Charlottesville and Albemarle Counties, Charlottesville, community center bldg. as war memorial. **$250,000.**

★**Wash., Everett**—School Bd., Everett, plans by W. A. Mallis, Lyon Bldg., Seattle, Zone 4, altering, enlarging Washington School, **$126,000;** Garfield School, **$126,000;** constructing 4 schools. **$200,000** each; Peck's Drive School, **$184,500;** Junior High School, **$750,000;** Junior College, **$1,000,000.** CD 10/13—ENR 12/28, under Postwar Projects.

Wash., Kelso—School Bd., Kelso, defeated bonds for Catlin school, West Kelso. **$200,000** CD 10/4—ENR 10/18.

Wash., Friday Harbor—School Dist. 149, Friday Harbor, plans by W. A. Mallis, 330 Lyons Bldg., 3 and James Sts., Seattle 4, high school. **$150,000.** Financing provided. CD 10/26.

Wash., Ritzville—School Bd., Ritzville, plans bond election in December, grade school. **$200,000.** Financing not provided. Geo. M. Rasque & Son, Washington Trust Bldg., Spokane, archt. CD 5/9—ENR 5/17, under Postwar Projects.

★**Wash., Seattle**—University of Washington, E. 47 St. and 17 Ave. N.E., Zone 5, plans by Bebb & Jones, Hoge Bldg., Zone 4, student union bldg. **$500,000.** Financing provided. CD 11/8.

Wash., Seattle—City Light, City Light Bldg. 3 and Madison Sts., Zone 4, 4 substations in West Seattle, **$160,000.** Financing provided. E. R. Hoffman, city light supt. CD 6/13—ENR 6/21.

Wash., Sedro-Woolley—School Dist., Sedro-Woolley, plans by W. A. Mallis, Lyon Bldg., Seattle, Zone 4, primary bldg., **$120,000;** vocational bldg. addn., **$30,000;** remodeling high school gymnasium, **$50,000;** Samish School, **$40,000.** Financing not provided. CD 6/14—ENR 6/28, under Postwar Projects.

★**Wash., Selah**—Yakima, Kittitas, Klickitat, Venton, Franklin and Grant Counties, Yakima County Court House, Yakima, sanatorium. **$750,000.** Financing not provided.

★**Wash., Sumner**—School Dist. 320, Sumner, plans by Mock & Morrison, Perkins Bldg., Tacoma, 2 story high school, 1 story high school addn., 2 story garage, 2 story auditorium, 1 story school addn. **$520,000.** Financing not provided.

Wis., Fennimore—City, City Hall, power plant addn. **$45,000.**

Wis., Kaukauna—City, City Hall, hospital, **$225,000.**

Alta., Edmonton—Dom. Govt., c/o Dpt. Veterans Affairs, Ottawa, Ont., 50-bed mental reception unit for observation, diagnosis and treatment of recoverable mental cases. **$250,000.**

★**Alta., Edmonton**—Pub. School Bd., Edmonton, plans by M. C. Dewar, 501 Civic Block, high school. **$1,099,500.** CD 3/24/44—ENR 4/6/44, under Postwar Projects.

★**Alta., Edmonton**—University Hospital Bd., Edmonton, University Hospital addn. **$550,000.**

★**Man., Winnipeg**—Municipality, by law approved, hospital for aged and infirm, **$650,000.** W. D. Hurst, City Hall, engr. CD 11/16.

★**Man., Winnipeg**—School Dist. 1, William and Ellen Sts., plans by W. A. Martin, c/o owner, schools. **$1,100,000.** CD 9/30/43—ENR 10/7/43, under Postwar Projects.

N. S., Halifax—Dom. Govt., Ottawa, Ont., plans by Dpt. Naval Affairs, Cartier Square, Ottawa, Ont., Military Dist. 6 headquarters bldgs. **$150,000.**

N. S., Halifax—Municipality, renovating City Field main bldg. **$191,000.** D. MacKinnon, City Hall, comr. Works and engr.

★**N. S., New Glasgow**—Picton County General Hospital Bd., D. E. Canley, advisor, McGregor Bldg., plans by E. J. Turcotte, 1010 St. Catherine St. W., Montreal, Que., 6 story, 46x225 ft. and 46x90 ft. T-shaped hospital, separate boiler house, laundry bldg., etc., Balfour and View Sts. Approx. **$1,000,000.**

N. B., Saint John—Province of New Brunswick, Ministry of Municipal Affairs, Fredericton, jail farm with bldgs. **$300,000.**

N. B., Campbelltown—Province of New Brunswick, Fredericton, provincial hospital. **$350,000.** Architect, c/o Ministry Health, Fredericton.

N. B., Saint John—Municipality, remodeling market **$50,000;** or rebuilding entire structure, **$400,000.**

Ont., Goderich—Huron Co. Council, R. E. Shaddock, chn., Exeter, plans by L. G. Bridgeman, Royal Bank Bldg., London, courthouse and county bldg. **$275,000.** CD 8/22—ENR 9/6, under Postwar Projects.

Ont., Hespeler—Hespeler School Bd., D. Panabaker, chn., plans by J. B. Parkin, 96 Bloor St. W., Toronto, 18 room school. **$400,000.**

Ont., Kitchener—Province of Ontario, c/o Ministry Educ., Toronto, Training and Re-establishment Institute for veterans, **$150,000.**

Ont. Kitchenr—Province of Ontario, c/o Ministry Educ., Toronto, Training and Re-establishment Institute, for veterans. Over **$150,000.**

Ont., Langston—Public School Bd., F. Robinson, secy, plans by Page & Steele, 20 St. Clair Ave., Toronto, school. **$150,000.**

Ont., London—Wartime Housing Ltd., 55 York St., Toronto, 50 addnl. houses.**$225,000.**

Ont., North Bay—Queen Victoria Memorial Hospital Bd., H. F. Pilley, clk., plans by P. J. O'Gorman, 209 Mackay Bldg., Sudbury, hospital unit. **$250,000.** Rate payers voted in favor.

Ont., Orillia—Orillia Water, Light & Power Comn., Dr. R. E. Hipwell, chn., office and sub-station. **$150,000.** L. G. McNiece, c/o owner, engr.

Ont., Ottawa—Dom. Govt., c/o Dpt. Justice, Ottawa, barracks bldg. to accommodate members of R.C.M.P. and their families, **$150,000.** Dpt. P. Wks., Ottawa, Ont., engr.

★**Ont., Ottawa**—University of Ottawa, Laurier Ave. E., plans by J. S. Lefort, 175 Champlain St., Hull, first unit of medical faculty bldg. Total est. **$4,000,000.** CD 7/16—ENR 7/19.

Ont., Rockcliffe Park (Postal Dist. Ottawa)—Dom. Govt., c/o Ministry Justice, Ottawa, central heating plant. **$45,000.**

Ont., Sault Ste. Marie—City, J. McMeekin, mayor, rink-auditorium, community center. **$400,000.** Adamson & Morgan, 3 St. Thomas St., Toronto, archts. G. G. Reid, 7 Edmund St., Toronto, engr. CD 1/12—ENR 1/18.

Ont., Timmins—Town, A. L. Shaw, clk., community memorial hall. **$400,000.** Rate payers to vote Dec. 14 for money for construction. CD 5/26/44—ENR 6/15/44, under Postwar Projects.

Ont., Welland—Province of Ontario, c/o Ministry of Health, Queen's Park, Toronto, hospital for chronically ill. **$200,000.**

★**Ont., Ottawa**—Dpt. P. Wks., Ottawa, plans by C. D. Sutherland, c/o owner, office bldg. for Dpt. Veterans Affairs. **$3,500,000.** CD 3/2—ENR 4/5, under Postwar Projects.

Ont., Ottawa—City, S. Lewis, mayor, plans by Burgess & Gardiner, 25 Bellwood Ave., police station, Lyon St. between Sparks and Queen Sts. **$300,000.** J. C. Askwith, c/o owner, engr.

Ont., Petrolia—Municipality, plans by Beck & Eadie, 220 Bloor St., Toronto, hospital. **$150,000.**

Ont., Port Arthur—City, Community Center Committee, plans by A. Angus, 43 Pub. Utilities Bldg., community center. **$350,000.** CD 9/8/41—ENR 9/21/44. Under Postwar Projects.

Ont., St. Catherines—City, W. J. MacDonald, mayor, 75 semi-permanent houses. **$300,000.**

Ont., St. Mary's—Bd. Educ., J. W. Dunsecy., plans by S. B. Coon & Son, 4 St. Thomas St., Toronto, collegiate addn. **$175,000.**

Ont., Sault Ste. Marie—Bd. School Trustees, H. L. Trites, chn., 46 The Drive, plans by Page & Steele, 20 St. Clair Ave., Toronto, Merrifield School. **$225,000.** Queen Elizabeth school, **$225,000.**

Ont., Stratford—Bd. Educ., C. E. Martyn, secy., City Hall, vocational school and auditorium, **$200,000.**

★**Ont., Stratford**—Stratford General Hospital, 86 John St., plans by Marani & Morris, 46 Bloor St., Toronto, hospital, St. Vincent St. **$750,000.** CD 4/20—ENR 5/3, under Postwar Projects.

Ont., Timmins—Algonquin Regiment, Timmins, armory. **$150,000.**

Ont., Toronto—Bd. Educ., York Twp., C. A. Webster, secy., plans by C. W. Smith, 602 Jane St., school addn. **$175,000.**

Ont., Toronto—City, P. Welfare Dpt., 149 College St., plans by K. S. Gillies, City Hall, 2 story, steel, masonry juvenile detention home. **$200,000.** CD 8/31—ENR 9/6.

Ont., Toronto—Province of Ontario, c/o Ministry Educ., Toronto, vocational bldg. addn., at Training and Re-establishment Institute. **$150,000.**

Ont., Waterloo—Municipality, N. G. Bolduc, clk., artificial ice plant, **$40,000.**

Ont., Willowdale (br. Toronto)—Earl Haig Collegiate Institute School Bd., T. R. Deacon, chn., 357 Bay St., Toronto, plans by Craig & Madill, 62 Charles St., Toronto, collegiate addns. **$250,000.**

Que., Beauceville—Province of Quebec, c/o Dpt. Educ., Quebec City, school. **$150,000.** Dpt. P. Wks., Quebec City, engr.

Que., Gaspe—Province of Quebec, Quebec City, refrigeration and cold storage plant, Gaspe Harbour. **$50,000.** Dpt. Maritime Fisheries, Quebec City, engr.

★**Que., Hull**—Reverend Sisters of Providence, Amyot Park, Wrightville, Hull, 300 bed hospital. Over **$750,000.**

Que., Malartic—Municipality, 100 dwellings. **$275,000.**

Que., Noranda—Municipality, 100 dwellings: **$350,000.**

Que., Pointe aux Trembles—Wartime Housing Ltd., 55 York St., Toronto, Ont., 44 dwellings. **$220,000.**

Que., Quebec City—Municipality, recreational centre, Victoria Park. **$238,000.** E. Hamel, City Hall, engr.

★**Que., St. Laurent**—Municipality, 300 dwellings in Garden City area. **$1,500,000.**

Sask., Regina—General Hospital Bd., Regina, nurses' home, **$200,000.**

Sask., Regina—Municipality, substation, Elphinsone St. **$40,000.**

Sask., Swift Current—Municipality, c/o Mayor Rutherford, civic center, **$150,000.**

Sask., Swift Current—Province of Saskatchewan, Regina, factory. **$40,000.** Dpt. Reconstruction, Regina, engr.

Que., L'Assumption—Dpt. Roads, Quebec city, 2 story, 45x100 ft. garage, repair shop and storage bldg. **$60,000.**

Que., Ste. Therese—Dpt. Roads, Quebec City, 2 story, 45x100 ft. concrete block, garage, repair shop and storage bldg. **$55,000.**

Que., Val d'Or—Congregation of Grey Nuns of the Cross, Sussex and Water Sts., Ottawa, Ont., and Provincial Dpt. Health, 1050 La Canardiere, Quebec City, 100-bed hospital. **$200,000.**

Que., Val d'Or—Val d'Or School Bd., J. C. Perry, chn., composite high school. Over **$150,000.**

★**Sask., Assiniboia**—Dpt. Veterans Affairs, 365 Bay St., Ottawa, Ont., 12 bldgs. for occupational therapy center. **$500,000.**

Sask., Saskatoon—Dpt. P. Wks., D. Webster, deputy minister, Regina, 3 story, 70x120 ft., brick, tile engineering bldg. addn. at University of Saskatoon, **$200,000.**

Proposal Advertisements see p. 153
Proposed Projects see p. 100

OFFICIAL PROPOSALS

(587)

Aswan Dam Hydro-Electric Scheme

EGYPTIAN GOVERNMENT
MINISTRY OF PUBLIC WORKS
HYDRO-ELECTRIC POWER COMMISSION

The Egyptian Government announces that tenders will be invited shortly for the erection of a Hydro-Electric Generating Station for developing the water fall available at Aswan Reservior. The station will have an initial installed capacity of approximately 280,000 KW.

The specifications will be divided into the following Main Sections and Contractors will be invited to submit tenders for one or more sections of the Works. Tenders for each section will include the supply, delivery, erection, setting to work and maintenance of the plant concerned:

1—Civil Engineering Works and Buildings.

This work will include the construction camp and such services as may be required.

2.—Seven 57,000 HP Kaplan Type Water Turbines and Auxiliaries.

3.—Seven 45,000 KVA Alternators-Exciters and Auxiliaries.

4.—Switchgear, bus bars and supports, connections, metering, synchronising equipment and protective gear.

5.—Three 105,000 KVA Main Transformers.

6.—Cables and wiring.

7.—Penstock and butterfly valves.

8.—Cranes.

The specifications, Drawings and Conditions of contract are now in preparation and when completed the Government will advertise in the Press the date on which they will be available for issue. Copies will be obtainable from the Hydro-Electric Department, Ministry of Public Works, Cairo, from the Royal Egyptian Legations and Consulates abroad and from the Government's Consulting Engineers, Messrs. Kennedy and Donkin at 12 Caxton Street, London S.W.1.

The Conditions of Contract will stipulate that tenderers shall make themselves thoroughly familiar with the site before tendering, and all facilities will be given for visits by representatives. Such visits will naturally be undertaken by each Contractor solely at his own risk and expenses.

The Department in Cairo and the Consulting Engineers in London will be pleased to answer preliminary enquiries from prospective tenderers.

Bids: Jan. 15 (579)

CAGES, ELECTRIC HOISTS, Etc.

CONTRACT 356

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A. M., Eastern Standard Time, on Tuesday, January 15, 1946, for Contract 356, for furnishing, testing and delivering one cage or sinking pump, one service cage, six electric hoists, two hoist motors, three cable sheaves, two lengths of steel wire rope and one cable reel with electric cable, complete with all appurtenances, for the Shafts 6, 13 and 23 drainage chambers of the Delaware aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of ten thousand dollars ($10,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc. can be obtained at the office of the Secretary at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, HENRY HESTERBERG, RUFUS E. McGAHEN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: Jan. 8 (581)

Electric Motors, Etc.

CONTRACT 362

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A. M., Eastern Standard Time, on Tuesday, January 8, 1946, for Contract 362, for furnishing, testing and delivering two electric motors for operation of 60-inch by 54-inch gate valves, ten electric motors for operation of 48-inch gate valves and electrical control equipment for the West Branch effluent chamber of the Delaware aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of one thousand dollars ($1,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety etc. can be obtained at the office of the secretary at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted at a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, HENRY HESTERBERG, RUFUS E. McGAHEN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

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Telescope 12" long, 25 power—Horizontal Circle 4½" with vernier to 5 minutes—Vertical Arc 3"—Clamp and Tangent Screw for Vertical and Horizontal Limb—Instrument weighs 11 pounds, tripod 9 pounds.

Price complete with Tripod, Carrying Case, Sunshade, and Dust Cap $115.00. Can be furnished with a compass at $12.50 extra—Stadia Wires $5.00 extra.

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POSITIONS WANTED (full or part-time individual salaried employment only). ½ the above rates, payable in advance. (See ¶ on box Numbers.)

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DISPLAYED—RATE PER INCH:

The advertising rate is $7.75 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

NEW ADVERTISEMENTS received by January 3rd appear in January 10th issue subject to limitation of space available

POSITIONS VACANT

CONSTRUCTION AND Maintenance engineer registered in Pennsylvania to supervise power plant and all other utilities, also construction and maintenance of buildings in large state hospital, Norristown State Hospital, Norristown, Pa.

MECHANICAL ENGINEERS with Chemical Plant experience. Must have experience in design, construction and maintenance of chemical process equipment and facilities. Write giving details, past experience and salary expected. Plant in Eastern Pennsylvania. P-945, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

WANTED EXPERIENCED Estimator for heavy construction work such as shafts, tunnels and subways. Reply stating experience. P-947, Engineering News-Record, 330 W. 42nd St., New York 28, N. Y.

AN EASTERN Pennsylvania structural steel and light iron fabricating shop desires the services of a designer, estimator, and salesman capable of designing simple steel structures. An excellent opportunity for a young man with the proper qualifications. P-948, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

SUPERINTENDENT ON Road, sewer and concrete construction in small organization. Steady work year around. Vicinity: Union, Middlesex & Somerset Counties of New Jersey. State age, experience, and salary expected. P-949, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ARCHITECTURAL DRAFTSMEN: Experienced in large industrial and commercial work by leading firm of Chicago Architects with outstanding record. Must be qualified to assume responsibility for full preparation of Working Drawings. Excellent opportunity. P-959, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

CONSTRUCTION ENGINEER: skilled in surveying, drafting, calculating, and estimating. P. O. Box 2240, Norfolk, Va.

DESIGNERS STRUCTURAL steel for permanent work in New York City, must be capable of earning a substantial salary. Write full particulars regarding qualifications. Men in office know about this ad. P-974, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

WANTED: STRUCTURAL steel detailers for buildings, bridges, etc. Permanent for right men. State experience and education. Tampa Shipbuilding Company, P. O. Box 1838, Tampa, Fla.

POSITIONS WANTED

BUILDING CONSTRUCTION superintendent experience covers 30 years and over 40 million dollars of various kinds of structures and further includes estimating, purchasing and general manager with reputable firm. PW-864, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

MANAGER: SPECIAL machinery and structures. Broad experience all trades. Twenty-years production, labor relations, sales, contracts, engineering, maintenance. Top record as organizer and producer. Engineering degree. PW-915, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

SUPERINTENDENT CONSTRUCTION: C.E., 19 years experience, age 40, speaks 3 languages. Location immaterial. Available first of year. PW-913, Engineering-News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

GRADUATE CIVIL Engineer: Age 33, 12 years experience in varied river work including hydrological investigations and dredging work. P-3 civil service rating. Desire permanent position. PW-908, Engineering News-Record, 520 North Michigan Ave., Chicago 11, Ill.

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WANTED

DESIGNERS

ARCHITECTURAL
STRUCTURAL
POWER PIPING
ELECTRICAL

5 to 10 yrs. experience required in Power Plant or Heavy Industrial Structures. Positions in Philadelphia

United Engineers & Constructors Inc.
1401 Arch St. Phila. 5, Pa.

WANTED

ENGINEER

Experienced in sales contracting, quantity surveys, structural steel designing, wanted by Structural Steel Fabricating Shop having monthly fabricating capacity of 1,000 tons per month.

35 years' continuous operations

ROBBERSON STEEL COMPANY
P. O. Box 1675 Oklahoma City, Okla.

WANTED

ENGINEERING DRAFTSMEN

STRUCTURAL & CONCRETE WORK

State full details of training and experience in first letter

THE STEARNS-ROGER MANUFACTURING CO.
1720 California St.
Denver, 2, Colo.

WANTED—SHOP SUPERINTENDENT

Structural steel fabricating shop, approximately 500 tons per month capacity, located Middle Atlantic States and specializing in fixed and movable highway bridges, mill buildings, light and heavy truss work both riveted and welded, plate work, etc., wants thoroughly competent, sober, and industrious shop superintendent. Give complete record of past experience, salary expected, references, etc.

P-881, Eng. News-Rec., 330 West 42nd St., N. Y.

The University of Trondheim, Norway

(Norges Tekniske Hoiskole) is seeking Norwegian engineers to fill 2 vacant professorships, one for naval architecture and one for dam construction. For details apply immediately Norwegian Embassy, Washington 7, D.C.

Salaried Positions $2,500-$25,000

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CITY OF MONROE, MICHIGAN
CIVIL SERVICE COMMISSION
Public Notice of Examination

The City of Monroe invites qualified persons to apply for the position of

SENIOR CIVIL ENGINEER

Salary: 225.00—265.00 per month.
Last date for filing applications: 12 Noon—January 5, 1946.
Date of examination: To be announced.

While it is intended that this will be an unassembled examination, consisting of evaluation of experience, education and general fitness, the Civil Service Commission is reserving the privilege of conducting a written test, if, in its opinion, it is desirable.

Applicants to be eligible for appointment must obtain an average of not less than 70 in the examination.

Application blanks and further information may be secured from the office of the City Clerk, City Hall, Monroe.

WANTED

DRAFTSMEN

Large steel company in Pittsburgh area has several opportunities for draftsmen with high school or college education and experience in the following areas: design of steel mill and steel foundry products; railroad track accessories; layout and design of steel mills, blast furnaces, open hearth furnaces, and power plants; design of fabricated concrete bars; layout of electric power and control equipment; general mechanical design and layout. Please submit details, statement of experience and education, inexpensive photograph, and required minimum earnings.

P572, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

Two $5000 Positions Available

1. ESTIMATOR-COST ACCOUNTANT And
2. LAND SURVEYOR (Licensed)

For Suburban Washington housing project.

Write

GRAHAM CONSTRUCTION COMPANY
1010 Vermont Avenue, N.W., Washington 5, D. C.

JUNIOR CONCRETE ENGINEER
WANTED

For bridges and frames by well known concern. Location New York City. Must be familiar with modern analysis method and neat draftsman. Position is permanent and progressive and entails interesting development work. Starting salary commensurate with experience.

P-940, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

WANTED

PRODUCTION ENGINEER

Structural Steel Fabricating Shop wants Engineer experienced in planning and supervising production. Plant capacity 1000 tons per month.

35 years' Continuous operations.

ROBBERSON STEEL COMPANY
P. O. Box 1675 Oklahoma City, Okla.

RECONVERSION . . . . YOUR OPPORTUNITY

Reconversion may be your opportunity to take part in a progressive program leading to your advancement.

The Austin Company is offering opportunities to Engineers who can design and or prepare engineering drawings for industrial buildings and their facilities. Assignments are not for specific projects but are in our regular engineering staffs in long established offices, located on the East Coast, Central West, Gulf Coast and West Coast.

Positions are open to men possessing a sound background of education and experience and also to recent college graduates qualifying in—

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Industrial Plant Equipment • Process Piping • Power Plants • Heating Systems • Air Conditioning and Ventilation • Conveying Systems • Plumbing and Sewers • Sprinkler Systems.

ELECTRICAL

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BUILDING DESIGN

Structural Steel • Reinforced Concrete • Architectural • Industrial Plant Buildings and Related Structures.

THE AUSTIN COMPANY

National Headquarters

16112 Euclid Avenue **Cleveland, 12, Ohio**

WANTED

Construction Superintendents

for Bridge and Road Construction Work in Eastern States. Permanent position if satisfactory. Familiar with cofferdam, pile driving, concrete and earth moving. Preferably 30-40 years of age. Capable handling work up to half million. Should have following of foremen. Give complete details in reply.

P-886, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

WANTED

ESTIMATOR

Competent for ship work, structural steel and plate work. Give experience and references. Excellent opportunity.

INGALLS SHIPBUILDING CORP
M. S. Esslinger Pascagoula, Miss.

WANTED

MANAGER

for construction division to take full charge. Executive with ability to organize and get results. Must be experienced with oil refineries, chemical, steel construction, etc. Write stating age, education, experience, references and salary expected.

P-860, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

DIRECTOR OF RESEARCH AND DEVELOPMENT

WANTED—Executive with ability to take full charge of all research developing and engineering. Must be familiar with oil refineries, chemical equipment and construction, general plate construction, general process equipment. Location midwest. Write stating experience, education, age, companies worked for, positions held, salary expected, references. Enclose picture.

P-942, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

WANTED

CONTACT MAN

For obtaining new business for long established New York Building Construction Company. One with similar experience preferred. Attractive compensation for right man. Give complete information.

P-944, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

OPPORTUNITIES

FOR

DRAFTSMEN

Structural Detailers and Checker

Heavy-Machine Designers

Experienced in detailing and checking drawings

ADDRESS EMPLOYMENT OFFICE

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

WANTED

Structural Draftsmen

Several experienced detailers and checkers familiar with making fabricating shop details. Please give outline of experience, rate desired and when you could report. Overtime.

WHITEHEAD & KALES CO.
58 Haltiner St. River Rouge 18, Mich.

WANTED DESIGNING DRAFTSMEN

CIVIL and STRUCTURAL

For either industrial plant layout or general building design.

MECHANICAL

For layout of mechanical equipment and piping of chemical plant industrial buildings.

Give full experience, education, age, present salary and salary expected. Enclose snapshot.

Good post-war prospects.

Applicants must be able to obtain Statement of Availability.

E. I. du Pont de Nemours & Co., Inc.
Personnel Division
Wilmington 98, Delaware

WANTED

SQUAD BOSS AND CHECKER

Structural Steel details for factory buildings, warehouses, schools, churches, store and office bldgs. Give full account of experience background, age, salary.

35 years continuous operations.

ROBBERSON STEEL COMPANY
P. O. Box 1675 Oklahoma City, Okla.

POSITIONS WANTED

(Continued from page 154)

STONE CONSTRUCTION Superintendent cut and rubble work. Capable draftsman at architectural detailing and design. Twenty-one years experience on heavy and light construction. Married, two children. PW-932, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

MASTER MECHANIC: Have thorough knowledge all types heavy construction equipment, 25 years experience, including actual repairing also supervision of maintenance and operation. No preference as to location. Seeking permanent connection, but will consider job of short duration. PW-936, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

CRANE OPERATOR: Thoroughly experienced 11 years trucks, cranes, light and heavy equipment, clamshells, etc. Licensed, maintenance, American. Go anywhere. PW-943, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CONSTRUCTION ENGINEER: Returned Veteran, 37—15 years varied experience gen. building• construction, earthwork, piledriving, rein. concrete, poleline and plant engineering. Structural and arch. design. Desires position with small progressive contractor, engineering firm or industrial concern which does own expansion work. Reasonable assurance of permanency required. PW-958, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ARCHITECTURAL & Structural designer, 20 years experience building structures, central states preferred. PW-962, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

POSITIONS WANTED

STRUCTURAL DESIGNER, graduate C.E., [illegible] years experience all types buildings, [illegible] and reinforced concrete, superstructures [illegible] foundations; industrial and commercial buildings; water supply and sewerage structures, [illegible] refineries; includes 4 years construction; [illegible] handle squad; past 2 years in South America, prefer New York City; available Jan. [illegible] PW-912, Engineering News-Record, 330 [illegible] 42nd St., New York 18, N. Y.

CIVIL ENGINEER: Age 37, now employed, desires permanent connection with [illegible] tractor or engineering firm in Southwest. Have held responsible positions past 15 years with both contractors and engineers on most types of construction including earthwork, concrete, airports, waterworks, sewers, buildings, REA, etc. Some estimating and design. PW-935, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

CONTRACTORS CHIEF Engineer General Superintendent. Well grounded experience of over twenty years in general contracting (heavy, marine, and building construction) handling estimates, bidding construction methods, subcontracts, and job management. Good knowledge of construction costs under varied conditions in competitive construction. Familiar managing work contracted from state, municipal, various Federal agencies, and private architects and engineers. Will be released from Navy SeaBees in January. Originally from Midwest and East but location immaterial. Married, in good health, energetic and conscientious worker. Graduate civil engineer. Want connection with future and the financial considerations mutually satisfactory in accordance with my ability to produce. PW-929, Engineering News-Record, 68 Post St., San Francisco 4, Cal.

CIVIL ENGINEER, graduate, 20 years design and construction of tunnels, buildings, bridges, power plants, waterfront structures. Now completing contract in South America. Available in one month. PW-950, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CONSTRUCTION MANAGER: Estimator, superintendent. Graduate civil engineer with 17 years experience all types of general construction as project manager, superintendent, and estimator. Desire permanent connection. Excellent references. Salary approximately $7,500. PW-951, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

GRADUATE ENGINEER: Two years experience in highway and bridge construction, one year experience in general surveying, two and one-half years in Army Engineers, 1st Lt. Railroad and bridge construction in France and Germany. References furnished upon request. Edward D. Soady, 240 Harwick Road, Springfield, Penn.

GENERAL SUPERINTENDENT; or assistant desires position with general contractor. Consider foreign assignment. Prefer rivers, harbors, waterfront work. Experience twenty-five years including dams, power plants, docks, piers, shipbuilding basins, flood control and drainage. PW-953, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

PROFESSIONAL ENGINEER: 24 years with contractors and consultants. Estimating, design office and field supervision on heavy construction. PW-956, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

GENERAL SUPERINTENDENT: Qualified to assume complete charge of all field work and responsibility for execution of construction and installation contracts. Experience covers work on nation wide basis and in other countries supervising 10 field organizations. Can furnish record and references that will stand investigation. PW-957, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

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STRUCTURAL ENGINEERING

Thirty-third Year

(In the following list, Courses A, B, and C are abbreviated from our complete Structural Engineering course).
A—Public Works Structures.
B—Architectural Engineering.
C—Special Course (State Board Exams for P.E.)
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Our Courses are offered principally to

ADULT CIVIL ENGINEERS AND ARCHITECTS

Ninety percent of our engineering students are former graduates (C.E.) from engineering colleges. Our courses have helped thousands of engineers to better positions, increased pay, and success "after forty"

Course B has helped many architects and draftsmen in passing the structural portion of State Board Examinations for license.

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College House Offices Harvard Square Cambridge, Mass., U. S. A.

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The successful bidder is the man who bids the right price. A correct estimate is the foundation of any builder's success. A job taken too cheap results in a loss; a job bid too high is lost to a competitor. Whether you are a beginner or experienced in estimating, you can't afford to pass up this offer to examine the Tamblyn System of Estimating absolutely free.

This system is based on forty years of actual construction experience, and by its use you can estimate costs according to your local rates and conditions. Thousands have used it successfully during the twenty-five years it has been on the market. This year the course has been completely revised to help you get your share of the post-war business.

Study the course for ten days absolutely free. If you decide you don't want to keep it, just return it. Otherwise send us $5.00 and pay the balance of $25.00 at $5.00 per month, making a total of $30.00 for the complete course. Send us your name and address today, and we will send you plans, specifications, estimate sheets, a copy of the Building Labor Calculator, and complete instructions. What we say about this course is not important, but what you find it to be after you examine it is the only thing that matters. You be the judge; your decision is final.

TAMBLYN SYSTEM, Johnson Building EN, Denver 2, Colorado

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Voltage will be corrected to your requirements

750 HP Enterprise	6 cyl	600 KVA	3/60/2400	1938
750 HP Superior	8 cyl	600 KVA	3/60/2400	1933
375 HP Alco	5 cyl	372 KVA	3/60/240	1938
375 HP Fairbanks	5 cyl	300 KVA	3/60/2400	1936
360 HP Fairbanks	6 cyl	300 KVA	3/60/2400	1932
330 HP G. M. Winton	4 cyl	282 KVA	3/60/240	1937
262 HP Buckeye	7 cyl	219 KVA	3/60/2300	1938
225 HP Buckeye	6 cyl	187 KVA	3/60/480	1941
187 HP Buckeye	5 cyl	150 KVA	3/60/240	1937
240 HP Buckeye	3 cyl	187 KVA	3/60/2300	1932
150 HP Buckeye	4 cyl	125 KVA	3/60/480	1939
112 HP Buckeye	3 cyl	94 KVA	3/60/240	1939

ALL REBUILT AND GUARANTEED

ROBERT SCHOONMAKER

Port Washington, Long Island, N. Y.

Phone Roslyn 1220

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CONSTRUCTION ENGINEER

Graduate C.E., age 40, with 19 years of responsible executive and field supervision of diversified heavy construction including highways, bridges, airports, manufacturing and industrial buildings, utilities, tunnels, levees and large hydro-electric developments. Desire connection with established contractor's organization with the opportunity of acquiring a financial interest in the business if mutually agreeable.

PW-960, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

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SEARCHLIGHT SECTION

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POSITIONS WANTED

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STRUCTURAL DESIGN Engineer. Graduate C.E. Age 43. 21 years experience designing steel, concrete and timber structures. Thoroughly competent to execute structural designs on any type of building or waterfront structure. Correspondence invited for position of responsibility. PW-963, Engineering News-Record, 68 Post Street, San Francisco 4, Cal.

DRAFTSMEN—EXPERIENCED in railroad highway, land, coal mines, topographic. PW-964, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

CONSTRUCTION AND Maintenance engineer-registered engineer and surveyor. 7 years construction and municipal engineering experience prior to entering army. 4 years in army as post engineer of large ordnance industrial establishment. Age 34. To be released from army and available February 1. PW-965, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

CIVIL ENGINEER: Graduate, 36 years experience; contracting, engineering, industrial, utility, concerns; also municipal and consulting. PW-966, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ASSISTANT SUPERINTENDENT: age 31, desires position with combined field and office work. Ten years experience general, and five years of responsible office and field work. Education equals one year college civil engineering. Detailed experience record furnished on request. Free to travel anywhere. Available at once. PW-967, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

STRUCTURAL ENGINEER: age 36, married. Bachelor's and Master's degree civil engineering. 10 years excellent experience—drafting, design, supervision and field in steel, concrete and wood. Knowledge Spanish. West coast or foreign connection preferred. PW-968, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

BRIDGE-STRUCTURAL Engineer (Cornell) over 30 years experience; design, construction, maintenance, inspection; steel, timber, concrete; foundations, superstructures; bridges, railway-highway structures; industrial buildings, coal tipples, bins, piers, wharves, drawspans, steel cars. Twenty years with railroads; work done with company forces. Engineer, Box 43, Swarthmore, Penna.

ENGINEER: (REGISTERED) over twenty years experience in mining, tunneling, quarrying and general heavy construction including service in the tropics. Experience includes supervision, safety, time and cost studies and efficient utilization of equipment. Want position as engineer or administrative assistant. PW-969, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

REGISTERED ENGINEER: Has open time for structural engineering design and details. Steel or concrete. 20 years experience. P.O. Box 962, Akron 9, Ohio.

PART-TIME WORK WANTED

STRUCTURAL ENGINEER, P.E., R.A. located New York City, broad construction experience, competent design steel, reinforced concrete, timber, desires connections as consultant or part time basis. PTWW-826, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

BUSINESS OPPORTUNITIES

TO ANYONE contemplating entering consulting practice middle west or middle south can offer attractive opportunity. BO-896, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

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42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
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14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
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	40 "	12.00
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1—American Pulverizer.

1—Cedar Rapids 15x36 jaw crusher with Caterpillar diesel engine, 22' elevator, 3'x12' revolving screen, mounted on 4 compartment, 50 ton portable bin. Rebuilt.

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1—Caterpillar model 44 drawn type grader hydraulically operated, leaning wheels. Rebuilt.

1—Caterpillar model 12 terracar #8F662. Rebuilt.

1—York Modern Corp. model SW drawn type grader #93608. Excellent condition.

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4—Buffalo-Springfield 10 ton, 3 wheel gasoline powered rollers. Completely rebuilt.

2—Galion Warrior, 8 ton, 3 wheel gasoline powered rollers with scarifier, electric starter. Completely rebuilt.

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1—Buffalo-Springfield 10 ton tandem gasoline powered roller #2548. Rebuilt.

1—Austin 8-10 ton gas powered tandem roller #T1028. Rebuilt.

1—Austin 3 wheel "Pup" rollers gas powered. Rebuilt.

2—Galion 3 wheel "Pup" rollers gas powered. Rebuilt.

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10—Double drum sheepsfoot tamping rollers, Blaw Knox, LaPlante Choate and Euclids, rebuilt condition.

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5-Ton "American" 70' Span	10-Ton P&H 78' Span	25-Ton Whiting 82' Span
5-Ton American 47'5" Span	10-Ton Bedford 78' Span	25-Ton Niles 46' Span
5-Ton Manning Maxwell Moore 31' Span	10-Ton "American" 27' Span	25-Ton Shaw 70' Span
5-Ton Case Gilbert 44'9¾" Span	15-Ton Whiting 57'3" Span	25-Ton Cleveland 106' Span
5-Ton P&H 44'9¾" Span	15-Ton Leonard-Burke 74'9" Span	30-Ton Morgan 30' Span
5-Ton Champion 44'9¾" Span	15-Ton Shaw 77' Span	30-Ton Niles 53'9" Span
5-Ton Bedford 34' Span	15-Ton Shaw 82' Span	30-Ton Whiting 60' Span
6-Ton P&H 78' Span	15-Ton Whiting 74'8" Span	35-Ton Northern 22' Span
6-7-Ton Milwaukee 70' Span	15-Ton Niles 32' Span	75-Ton Alliance 90' Span
6-Ton "American" 77' Span	15-Ton Chesapeake 55'6" Span	75-Ton Alliance 37' Span
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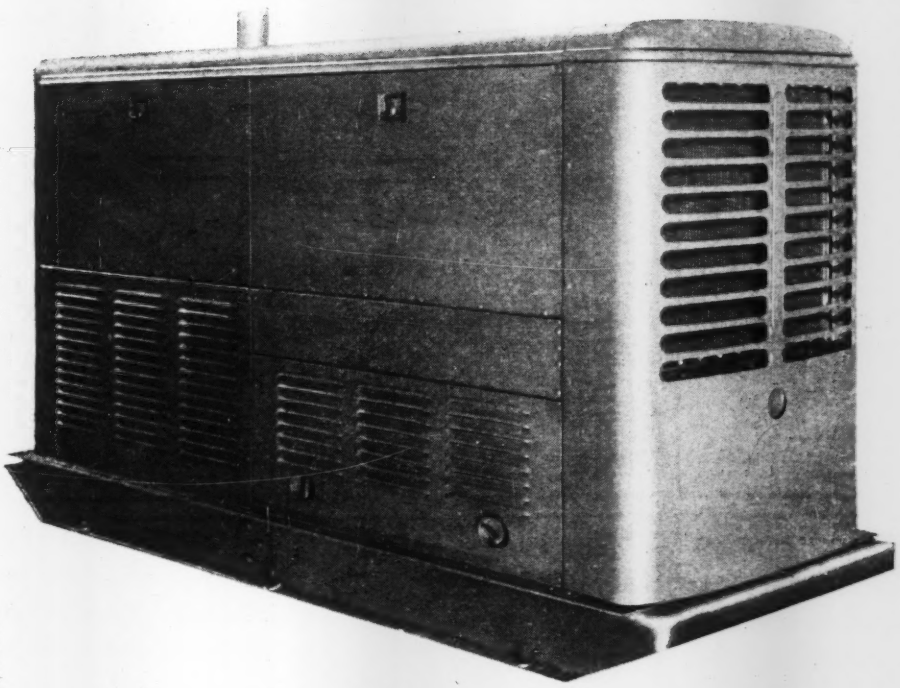

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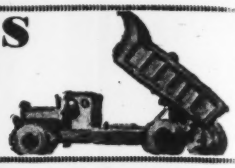

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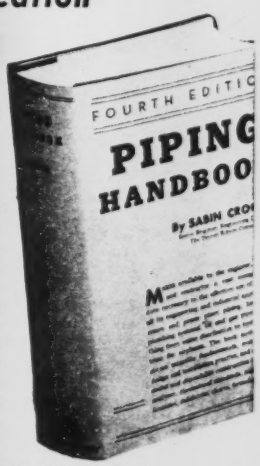

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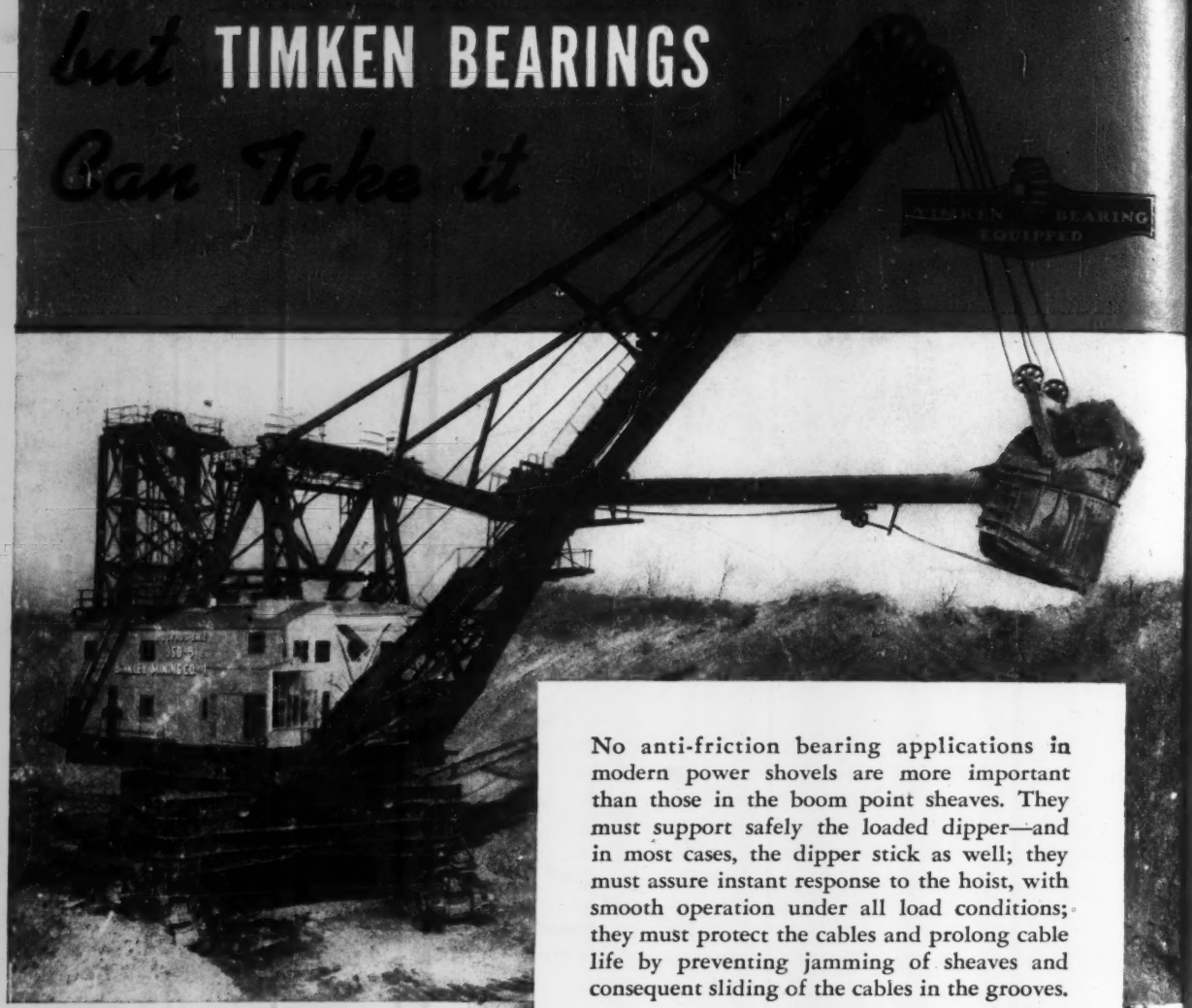

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